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Management accounting practices and performance in organic farms. The link to local development

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ABSTRACT

This study explores the influence of management accounting practices on the economic performance of organic farms. To do this, we collected survey data from 80 Spanish organic farms and use Partial Least Squares (PLS) to analyse the data. Our results show that the use of management accounting practices improves economic performance. We also find a positive association between the use of management accounting practices and the social impact of the farm. This points to the usefulness of these practices when it comes to implementing a strategy of differentiation linked to local resources. This paper offers guidance to the agents of the organic farm sector about the potential economic and social impact of the management accounting tools.

Keywords:

Organic farms; Management accounting practices; Local development;

Management accounting practices and performance in organic farms. The link to local development

1. INTRODUCTION

The aim of this work is to examine the link between management accounting practices and the economic performance of organic farms. We also explore whether these practices have any impact beyond the limits of the farm by affecting the social surroundings and thus local development. While most of the research on management accounting analyses large or small-and-medium-sized companies belonging to the industrial, commercial, or service sectors, there is a growing social and political interest in the development of sustainable food business initiatives with a positive social impact (organic label or farm-to-fork strategies) (Lobley et al., 2009; European Commission, 2020). Therefore, it is relevant to analyze the effect of management accounting techniques in a sector such as organic farming that contributes to sustainable local development (Lueg and Radlach, 2016).

In the current socio-economic context of high production costs combined with environmental concerns and the demand for healthier food, organic production provides added value. This has been reflected in recent decades by an exponential increase in organic farmland, with Spain being the third country in the world with the largest areas of organic agricultural land (Willer et al., 2021). At European level, support for the development of organic production has been manifested recently in an Action Plan presented by the European Commission. The overall aim of this Plan is to boost the production and consumption of organic products, with the objective of having 25% of agricultural land allocated to organic farming by 2030 (European Commission, 2021). In addition, on January 1, 2022, the new Regulation (EU) of the European Parliament and the Council on organic production and labeling of organic products (Reglamento UE 2018/848) has entered into force.

Most organic farms have a family or micro-enterprise nature and they usually work under budget constraints. Although they do not have a well-defined structure of cost control and management, their daily managerial practice is comparable to current management accounting practices (Ndemewah et al., 2019). Thus, we propose to analyze the effect of management accounting practices on the economic performance of organic farms.

Given the contribution of organic farming to rural development, we also explore the effect that the use of management accounting practices can have on the social surroundings of the farm.

Organic farms focus on product differentiation (Porter, 1980; Andersén, 2021) via organic labeling accompanied by short food supply chains. Management accounting techniques such as the balanced scorecard or benchmarking are appropriate for product differentiation strategies (Chenhall and Langfield-Smith, 1998a). In particular, these practices allow organic farmers to manage material and immaterial local resources (traditional techniques and products, heritage, landscape) and the use of local short marketing channels (direct retailing to end consumers, restaurants or grocery stores, agritourism). As such, management accounting practices can have a role to play in processes that go beyond individual farms and managerial concerns with enhancing their economic performance (Modell, 2014). This is especially evident in organic farms, which tend to have a higher level of local resource embeddedness (Müller and Korsgaard, 2018), and implies that the use of management accounting practices may have a positive social impact at the local level.

To analyse this empirically, we use data collected through surveys gathered from 80 organic farmers in the northern Spanish regions of Asturias and Galicia. We define management accounting practices as the use of tools, processes and information - formal or informal - for organisational decision-making, governance, control and accountability (Gottlieb et al., 2021). We measure management accounting practices with an indicator that comprises several individual control tools, including traditional practices such as costing and budgeting and newer practices such as indicator systems and benchmarking. The Partial Least Squares (PLS) technique is used to analyse the hypotheses proposed.

This paper responds to recent calls for in-depth studies on the outcomes of management accounting practices in farms (Ndemewah et al., 2019). We contribute to the academic literature on the role of different management accounting tools supporting product differentiation strategies (Chenhall and Langfield-Smith, 1998b). We also adopt a novel "inside out" perspective on management accounting research, exploring how these techniques affect a broader range of interests and constituencies in society (Modell, 2014). Additionally, from a practical point of view, we offer empirical evidence about the management accounting techniques that are best suited to the contingencies of organic farming.

2. LITERATURE REVIEW AND HYPOTHESIS

2.1. Management accounting practices in farms

The literature offers ample evidence on the effectiveness of management accounting on business performance. However, most of this research has been focused on large firms. Small and medium-sized enterprises (SMEs) have been studied far less (Lavia-López and Hiebl, 2015), and particularly little attention has been given to the farm sector (Shadbolt, 2008; Rikkonen et al., 2013; Ndemewa et al., 2019).

A recent review of the literature shows that “it is difficult to develop an overall picture of the use of management accounting practices in farms and farm enterprises because little research has been published on the topic, and these studies are mostly discrete and unconnected to the others. The findings reveal that the practice of management accounting in farms is subject to information problems and that the empirical research on this topic largely lacks a theoretical explanation” (Ndemewah et al., 2019). Moreover, when it comes to organic production, the current scientific literature is even scarcer, and what little there is tends to focus on specific models or types of farms (Ndemewah et al., 2019; Tashakor et al., 2019).

On the other hand, management accounting practices are influenced by factors such as the impact of family ownership on the business processes, government farm policies, market competition, technological changes, the seasons and the weather/climate, traditions, and the cultural and anthropic practices of each specific region. Thus, the limited findings to date on the practice of management accounting in farms indicate that caution should be taken when generalizing the current knowledge on the use of management accounting practices in other organizational forms to farming entities.

As with small firms, it may be said that farm managers use management accounting and control practices to a lesser extent, in less sophisticated and formalised forms, and for somewhat different purposes compared to larger and/or non-family firms (Lavia Lopez and Hiebl, 2015). Additionally, farmers normally prefer non-accounting sources of information in shaping their management decisions (Ndemewah et al., 2019), which is probably due to their limited access to resources, simple organisational structures (with managers close to operations), and lack of specialised staff and specialised skills (Lavia López and Hiebl, 2015). In smaller enterprises, there is usually not a structured use of management accounting techniques, with management accounting often undertaken by the owner-manager/entrepreneur.

However, farms often work with small budgets, so accounting-related issues such as budgeting or costing are especially relevant to farmers. Although they may not have a well-defined structure of cost control and management, their daily managerial practice is comparable to current management accounting practices (Ndemewah et al., 2019). Furthermore, farmers have naturally adopted accounting techniques that allow them to prepare budgets and calculate costs as part of their daily routine. This occurs particularly in the context of subsidized agriculture (e.g., through the EU's Common Agricultural Policy, CAP) or with special regulations such as mandatory requirements for organic certification. This acquisition of accounting skills by farmers can be explained by the fact that cost and management accounting comprises a set of tools that do not belong exclusively to the accounting domain but can be applied by any individual or professional group (Kurunmäki, 2004).

Some previous empirical studies find interesting results in this regard. For example, a quantitative study showed that fully-integrated management based on reliable accounting information and comprising planning and control phases is a factor that has a significant positive effect on farm efficiency (Puig-Junoy and Argilés, 2004). On the other hand, qualitative research has shown how the intense use of non-financial performance measures can lead to uneconomic outcomes within the agricultural sector by keeping farmers focussed on production and creating managerial blind spots with regard to profit (Jakobsen, 2017). Other studies have revealed that management accounting practices in small family farms depend on the relative extent of embeddedness in several institutional logics and that the stakeholders carry reasonings into organizations through the intensity of the interactions and the involved learning (Gottlieb et al., 2021).

This paper proposes to contribute to this literature by analyzing the effect of management accounting practices on the economic performance of organic farms.

2.2. Management accounting practices for enhancing the social impact and contributing to local development

Management accounting can also be implicated in processes that go beyond individual organizations and managerial concerns with enhancing their performance. Some authors claim a need to adopt an "inside out" perspective on management accounting research: rather than confining research to intra-organizational practices and processes, this requires us to explore how management accounting affects and becomes useful to society (Modell, 2014). This is particularly relevant for the organic farm sector, which generates a social impact that reflects a product differentiation strategy linked to local resources.

Although most farms do not usually adopt formal strategic planning (De Rosa et al., 2019), organic farms are focused on product differentiation. They apply this strategy via organic branding by meeting high levels of quality standards via product qualification (organic label) and by augmenting their portfolio with higher value-added products or by differentiated packaging (Capitanio et al., 2010). Organic producers therefore differ from conventional producers of commodity products for large industries. They must identify, assess and manage different alternatives to add value to their products and transfer this value to consumers (Darnhofer 2005). Organic farms present a higher level of local resource embeddedness due to both the use of extensive systems of production linked to the land in a specific geographical area as well as to traditional know-how. There is a process of codification that makes the chosen combination of resources transferable and comprehensible to consumers, who are mostly located in urban areas. This codification can take different forms, ranging from the creation and promotion of private brands to the use of collective certifications. Product qualification is a mechanism for linking local farmers and non-local actors through which farmers can signal to, and attract revenues from, exogenous actors. In this context, the use of organic production labels provides better bridges to other geographical areas (Müller and Korsgaard, 2018).

In addition, it should be noted that agri-food product strategies refer not only to the physical properties of the product (intrinsic qualities) but also to the conditions under which the product is produced, distributed and retailed (extrinsic qualities) (Kirwan, 2006). Direct marketing strategies (DMS) include, among others, direct retailing to end consumers, restaurants or grocery stores. This strategy allows a farm operator to capture a larger share of the consumers' food income budget by eliminating the intermediary in the supply chain (Detre et al., 2011).

Accordingly, organic farms can benefit from both traditional and more modern management accounting practices. Traditional management accounting practices such as budgeting or costing are focused on concerns internal to the organization and are financially oriented (Chenhall and Langfield-Smith, 1998a). Although farmers prefer to use informal practices and non-financial measures in their operational management, they usually use formal financial information to engage with stakeholders (e.g., relationships with the administration, banks, advisers, and so on) (Jonsson and Sandlund, 2017). Additionally, organic producers carry out commercial management tasks related to short channels where they must evaluate different marketing channels, clients and product formats, and for which they must propose a corresponding cost-benefit analysis.

A differentiation strategy, on the other hand, focuses on offering specialized product features that are valuable for customers. To implement these strategies successfully, farmers need to have an accurate vision of the current competitive situation in order to persuade customers about the features of the sustainable products (López-Valeiras et al., 2015). In this sense, newer management accounting practices, such as balanced scorecard or benchmarking, are tools directed at the external environment rather than the internal organization, and they combine both financial and non-financial information. These techniques have an explicitly strategic focus. The financial indicators reflect the financial result of an action whereas the non-financial ones refer to performance drivers (Kaplan and Norton, 1996). For example, balanced performance measures such as the balanced scorecard link measures of customer satisfaction, such as timely and reliable delivery, with other measures of key production activities, such as cycle time and throughput rates, while demonstrating the implications for financial outcomes (Kaplan and Norton, 1996). Benchmarking, on the other hand, emphasizes an outward focus and seeks to improve performance by learning from the experiences of effective organizations. This involves more than establishing best practice standards, and includes examining the processes used by high-performing organizations. It can help focus managers' attention on broad business principles and assumptions that stimulate the formulation of a variety of policies that may sustain customer service, distribution and delivery strategies (McNair and Leibfried, 1992). Previous work specializing in the farming sector argued for the suitability of the indicator systems (designed to fit farms' purposes) or benchmarking (for example using Farm Accountancy Data Network or FADN system and its database) for value creation in farms (Shadbolt 2008; Rikkonen et al., 2013).

2.3. Hypothesis development

The previous discussion highlights that organic farms follow a differentiation strategy focused on offering specialized product features that are valuable for costumers. To implement these strategies successfully, organizations need to have an accurate vision of the current competitive situation in order to persuade costumers about the features of sustainable products. Management accounting techniques such as balanced scorecard or benchmarking are suitable for this purpose. At the same time, given that they are not producers of commodities and, therefore, price-taking, they need to handle financial tools in their daily management, such as cost or budgeting. In light of this, we formulate the following hypothesis:

H1: The use of management accounting practices is directly associated with economic performance.

We also propose that these tools offer a comprehensive approach for controlling internal processes (manufacturing, distribution, customer services, delivery, etc.) within the organizational strategy framework. In particular, these practices allow the differentiation strategy to integrate material and immaterial local resources (traditional techniques and products, heritage, landscape) and the use of local short marketing channels (direct retailing to end consumers, restaurants or grocery stores, agritourism), all of which can contribute to the development of the local economy. Accordingly, we propose the following hypothesis:

H2: The use of management accounting practices is directly associated with a positive social impact of the farm.

Given that social impact is the reflection of a differentiation strategy linked to local resources, we also propose that there is a positive association between the social impact and the economic performance.

H3: The social impact positively influences economic performance.

The previous literature shows that both the use and evaluation of management accounting practices would be made more effective by explicitly considering the mediating role of information and communication technology (ICT) (Banker et al., 2008; Xiao et al., 2011). Given that mechanization, the use of digitalized information systems, monitoring techniques carried out using sensors and automated identification in farms have become more widespread (Ndemewah et al., 2019) we consider that these practices may have significant impacts on how management accounting is performed on farms. In consequence, we propose the following hypotheses:

H4: The use of management accounting practices is directly associated with the use of ICT.

H5: The use of ICT is directly associated with economic performance.

H6: The use of ICT is directly associated with the social impact.

Our research model is displayed in Figure 1. In line with the previous literature, as a control variable we have used the size of the farm (measured as the number of hectares), which may affect both economic performance and social impact.

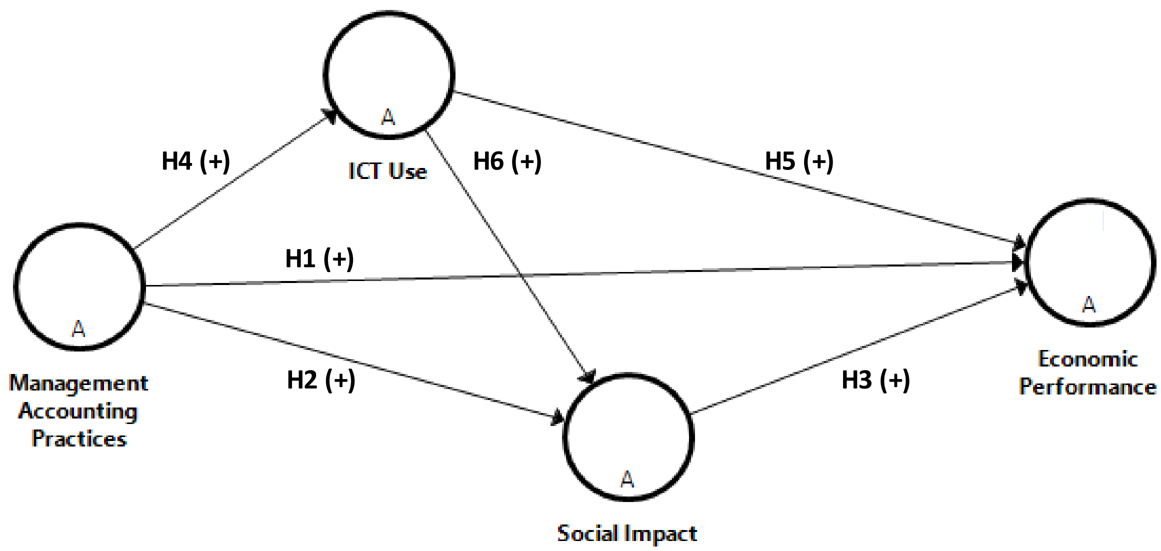

Figure 1. PLS structural model (control variable is omitted)

3. METHODOLOGY

3.1. Sample and data collection

The data we use comes from a survey that was designed to collect information on the practices and performance of of organic farms. With the collaboration of the Regulatory Council for Organic Farming in Asturias (COPAE), the farm cooperative Campoastur, and the EDES foundation, 80 responses were obtained. The study centered on the Spanish regions of Asturias and Galicia. Each of the farmers was interviewed with the questionnaire on their farm, a process lasting an average of one hour. The data, collected in 2020 and 2021, refer to the year 2019.

Table 1. Descriptive statistics of the 80 organic farms included in the study.

Variable	Mean	Standard Deviation	Minimum	Maximum
Number of workers	1.5	0.92	1	5
Land (ha)	31.2	28.8	0.3	115.5
Female manager (dummy)	0.25	0.43	0	1
Manager age (years)	46.4	8.4	24	70
Diversification (dummy)	0.26	0.44	0	1
Assured continuity (dummy)	0.36	0.48	0	1
Asturias (dummy)	0.78	0.41	0	1
Galicia (dummy)	0.22	0.41	0	1
Vegetable farm (dummy)	0.33	0.47	0	1
Livestock farm (dummy)	0.67	0.47	0	1

Table 1 shows descriptive statistics of some variables that characterize the studied sample. The following aspects can be highlighted:

- The average number of workers per farm is below 2 and the average size of the farms in terms of land was 31.2 hectares.
- In total, 26% of the farms carry out diversification activities, such as the transformation and commercialization of their products and others such as rural tourism.
- Livestock farms represent 67% of total farms, with the remaining 33% being vegetable farms.
- 25% of the farms are managed by a female, and the average age of managers is 46.4.
- 36% of the farmers consider that they have ensured continuity for the next 10 years, assigning this with 5 points on a scale from 1 to 5.

3.2 Partial Least Squares (PLS)

We use PLS to analyse the hypotheses proposed. PLS is a technique based on structural equations that allow the specification of models with complex relationships between observable and latent variables. A latent variable is not directly observable, being instead a construct made from other variables that theoretically form (formative indicators) or reflect (reflective indicators) a factor of interest for the study (represented by the latent variable). This technique has been widely used to analyse relationships between variables obtained from survey responses (Hair et al., 2017).

PLS path modeling is recommended in the early stage of theoretical development to test and validate exploratory models (Henseler et al., 2009). A PLS path analysis is based on two models, namely a *measurement model* (also called the *outer model*) relating the indicators to their latent variable, and a *structural model* (or *inner model*), relating some endogenous constructs to others.

The constructs used in this research are based on theoretical considerations and composed of a mixture of elements and were modelled as composites (Henseler, 2017; Suarez et al., 2017). Our composite variables were estimated in mode A or reflective due to the presence of high correlations between indicators in each construct (Rigdon, 2016).

PLS works well with small samples and complex models. The size of our sample, 80 cases, complies with the recommendations on the minimum sample size set by Hair et al. (2017).

In order to give robustness to the results of the PLS model, we complement it with regression analysis.

3.3 Constructs

Each variable was constructed through various items, all of which are grounded in the previous literature (see Table 2). In some cases, the items needed to be adapted to the characteristics of the organic farms. The constructs used in the analysis are presented in Table 2.

The dependent variable, economic performance, was constructed using three items. The interviewees were asked what they considered the situation of their farm to be compared with other farms in terms of (a) optimization of the investment in assets, (b) competitiveness of the farm and (c) profitability of the farm. A 5-point Likert scale was used to quantify the answers in each case, ranging from 1, ‘very inferior to other farms’ to 5, ‘very superior to other farms’.

Table 2. Constructs used in the analysis.

Constructs and items	Previous studies
ICT Use	Burke (2010), Vasa and Trendov (2020)
ICT1. To consult the information about the farm (databases)	
ICT2. To make the farm known to current and potential customers	
ICT3. For the commercialization of the products	
ICT4. For productive agricultural/livestock activities	
Management Accounting Practices	Chenhall and Langfield-Smith (1998)
MAP1. Cost analysis	
MAP2. Budgets and variance analysis	
MAP3. Indicator system	
MAP4. Benchmarking	
Social Impact	Speranza et al. (2014), Payne et al. (2019)
SP1. Positive impact on other economic activities in the area	
SP2. Maintaining the local tradition	
SP3. Positive impact on the rural world	
Economic Performance	Alsos and Carter (2006), Grande et al. (2011)
EP1. Optimization of the investment in assets	
EP2. Competitiveness of the farm	
EP3. Profitability of the farm	
Control Variable	
Size (ha)	

The independent variables were constructed using the items shown in Table 2. To measure the variables ICT Use, Management Accounting Practices and Social Impact, the interviewees were asked to value the degree of agreement with the items raised on a scale ranging from 1 (‘very low') to 5 (‘very high'). Size, measured as the number of hectares, is used as a control variable.

4. ESTIMATION AND RESULTS

4.1 Measurement Model

The measurement model addresses relationships between each construct and its indicators. The constructs, in turn, must fulfill certain internal consistency properties: reliability, convergent validity and discriminant validity.

Reliability. This measures the consistency of the indicators that make up the construct, in the sense that all of the indicators should be measuring the same concept. Cronbach’s alpha (Cronbach, 1970) and the composite reliability (Werts et al., 1974) are calculated, ranging from 0 (absence of homogeneity) to 1 (maximum homogeneity). When speaking of reliability, the usual requirement is that the values of both indices should be above 0.7. It can be seen in Table 3 that these indices exceed this minimum threshold in all cases.

Table 3. Reliability and convergent validity of constructs.

Variable	Loadings	Cronbach's Alpha	Composite reliability	AVE
ICT Use		0.823	0.868	0.623
ICT1. To consult the information about the farm (databases)	0.896			
ICT2. To make the farm known to current and potential customers	0.716			
ICT3. For the commercialization of the products	0.744			
ICT4. For productive agricultural/livestock activities	0.789			
Management Accounting Practices		0.832	0.889	0.668
MAP1. Cost analysis	0.821			
MAP2. Budgets and variance analysis	0.814			
MAP3. Indicator system	0.908			
MAP4. Benchmarking	0.717			
Social Impact		0.832	0.899	0.747
SP1. Positive impact on other economic activities in the area	0.853			
SP2. Maintaining the local tradition	0.880			
SP3. Positive impact on the rural world	0.861			
Economic Performance		0.818	0.892	0.734
EP1. Optimization of the investment in assets	0.842			
EP2. Competitiveness of the farm	0.897			
EP3. Profitability of the farm	0.830			

Convergent validity. The Average Variance Extracted (AVE) indicates the extent to which the construct variance can be explained by the chosen indicators (Fornell and Larcker, 1981). The minimum recommended value is 0.5 (Bagozzi and Yi, 1988), which means that over 50% of the variance of the construct is due to its indicators. Table 3 shows that the AVE of all the latent variables exceeds the value of 0.5. A second approach to analysing the fulfillment of convergent validity is to check whether the factor loadings of the principal component matrix are greater than a given value for each of the indicators. Jöreskog and Sörbom (1993) recommend a value greater than 0.5, while Chin (1998) recommends a value greater than 0.7. The second column of Table 3 shows that the more stringent criterion (i.e., a value greater than 0.7) is met in all cases.

Discriminant validity. This means that each construct should be significantly different from the other constructs. A factor loadings matrix was obtained to analyse the discriminant validity, as well as the cross-factor loadings. The factor loadings are Pearson correlation coefficients between the indicators and their construct. The cross-factor loadings are Pearson correlation coefficients between the indicators and the other constructs. The factor loadings should be greater than the cross-factor loadings. Therefore, the indicators should be more closely correlated with their construct than with the other constructs. This criterion is met in the proposed model, as shown in Table 4.

Table 4. Factor loadings matrix.

Variable	*ICT Use*	*Management accounting practices*	*Social Impact*	*Economic Performance*	*Size*
ICT1.	**0.896**	0.354	0.188	0.219	-0.281
ICT2.	**0.716**	0.101	-0.054	0.021	-0.327
ICT3.	**0.744**	0.093	0.070	0.083	-0.323
ICT4.	**0.789**	0.177	0.074	0.322	-0.122
MAP1.	0.238	**0.821**	0.346	0.290	-0.027
MAP2.	0.259	**0.814**	0.409	0.291	0.004
MAP3.	0.336	**0.908**	0.442	0.427	0.035
MAP4.	0.090	**0.717**	0.401	0.387	0.205
SP1.	0.178	0.483	**0.853**	0.357	0.138
SP2.	0.059	0.437	**0.880**	0.464	0.291
SP3.	0.135	0.339	**0.861**	0.406	0.029
EP1.	0.273	0.367	0.407	**0.842**	0.192
EP2.	0.284	0.342	0.346	**0.897**	0.144
EP3.	0.140	0.397	0.461	**0.830**	0.191
Size (ha)	-0.283	0.065	0.190	0.207	**1**

A second criterion for verifying the discriminant validity is to check that the square root of the AVE of the construct is greater than the correlation between that construct and all the others (Chin, 1998). Table 5 shows the correlation coefficients between the constructs. The square root of the AVE is shown on the diagonal. The condition of discriminant validity is also met following this criterion. Furthermore, for Bagozzi (1994) the correlations between the different factors that make up the model should not be higher than 0.8, as occurs in this case.

In addition, the discriminant validity was tested analysing the heterotrait-monotrait ratio of correlations (HTMT) (Hair et al., 2019). The value for each HTMT was equal to or less than 0.582, lower than the cut-off (0.90). Accordingly, all variables included in the model have discriminant validity

Table 5. Latent variable correlations.*

Variable	ICT Use	M. Account. P.	Social Impact	Economic Performance	Size
ICT Use	**0.789**				
M. Account. P.	0.289	**0.818**			
Social Impact	0.140	0.491	**0.865**		
Economic Performance	0.271	0.432	0.475	**0.857**	
Size	-0.283	0.065	0.190	0.207	n.a.

*The square root of the AVE is on the diagonal

We have seen that the requirements ensuring internal consistency are met. Latent variables can then be used to test the relationships in the model.

4.2 The Structural Model

PLS is used to estimate the structural equations with the aid of the SmartPLS 3 software (Ringle et al., 2015), which allows standardized Beta regression coefficients called 'path coefficients' to be obtained. These coefficients are the basis for testing whether the proposed hypotheses are supported or not. Table 6 shows the standardized path coefficients and the *t* statistics. Because PLS makes no distributional assumption, traditional parametric techniques prove inadequate for analyzing the significance of the estimated parameters, and therefore resampling procedures such as bootstrapping are used. We applied a bootstrapping procedure with 10,000 samples that provides the standard error for each path coefficient. This information permits a Student's t-test to be performed for evaluating the significance of path model relationships.

The results shown in Table 6 reveal seven significant path coefficients, allowing us to make the following conclusions:

- ICT use is associated positively with economic performance, but does not have a significant effect on social impact.
- The use of management accounting practices positively affects ICT use, social impact, and economic performance.
- Social impact presents a positive association with economic performance.
- The control variable, size, shows a direct and significant relationship with economic performance, but has no significant relationship with social impact.

Table 6. Relationships between constructs.

Variable	Beta		t-statistic
H1: M. Accounting Practices → Economic Performance	0.203	**	1.714
H2: M. Accounting Practices → Social Impact	0.463	***	5.148
H3: Social Impact → Economic Performance	0.306	***	2.847
H4: M. Accounting Practices → ICT use	0.289	**	2.044
H5: ICT use → Economic Performance	0.226	**	1.806
H6: ICT use → Social Impact	0.056		0.519
Size → Economic Performance	0.199	**	1.960
Size → Social Impact	0.176		1.473

Note. *** 1% level of significance, ** 5% level of significance, * 10% level of significance

The R^2 values measure the amount of variance of the constructs that are explained by the model. The R^2 of economic performance is 33.5%, being 26.9% in the case of social impact and 8.4% in ICT use. The decomposition of R^2 for economic performance indicates that the variable that has the most effect in its explanation is the social impact (0.145), followed by management accounting practices (0.088), ICT use (0.061), and size (0.041). On the other hand, the decomposition of the R^2 of social impact shows that the variable that contributes the most is management accounting practices (0.227), followed by size (0.033) and ICT use (0.008).

The management accounting practices construct has a total effect on the economic performance of 0.415 ($p < 1\%$), which can be decomposed into the sum of a direct effect of 0.203 ($p < 5\%$) and three indirect effects through the following mediating variables: 1) the social impact, with an effect of 0.142 ($p < 5\%$); 2) ICT use, with an effect of 0,065 ($p<10\%$); and 3) ICT use followed by social impact, with a minimal non-significant effect of 0.005.

The mediating effect of ICT use may be related to decisions of an operational nature (agricultural and livestock), while the mediating effect of social impact reflecting the differentiation strategy linked to the local environment.

It is also observed that ICT use does not have a significant direct effect on social impact, which would imply that ICT use does not have a positive effect on economic performance through the differentiation strategy.

4.3 Regression analysis

Four regression models are presented, two to explain economic performance and another two for social impact. ICT use and management accounting practices are taken as explanatory variables, measured by the mean value of the indicators that make up these constructs (those shown in Table 2). Also considered as control variables are size, measured in number of hectares, and dummies related to the region, the type of agricultural activity (livestock or vegetable), diversification and assured continuity. In Models 3 and 4, two constructs are used to reflect management accounting practices, indicating the use of financial and non-financial practices. Financial practices are measured by the mean value of the items related to the analysis of costs and budgets, while non-financial practices are measured by the mean value of the items related to the use of an indicator system and benchmarking.

Table 7. Regression analysis (n = 80).

Dependent variable	Economic Performance		Social Impact	
	Model 1	**Model 2**	**Model 3**	**Model 4**
ICT Use	0.1728**	0.1762**	0.0335	0.03502
Mgt. Accounting Practices	0.2968***	-	0.4170***	-
Financial Mgt. Accounting Practices	-	0.0830	-	0.1797*
Non-financial Mgt. Accounting Practices	-	0.2123***	-	0.2366**
Size (ha)	0.0023	0.0022	0.0034	0.0033
Asturias (dummy)	0.0366	0.0114	0.2985	0.2874
Livestock farm (dummy)	0.3910	0.3729	0.1825	0.1746
Diversification (dummy)	-0.1508	-0.1164	0.2425	0.2577
Assured continuity (dummy)	0.4751***	0.4615***	0.3534*	0.3474
Constant	1.6477	1.7070	2.0218	2.0479
R2 (%)	37.1	37.7	31.0	31.1

Note. *** 1% level of significance, ** 5% level of significance, * 10% level of significance

The estimates present similar results to the PLS model, showing a positive effect of management accounting practices on social impact and economic performance. Similarly, ICT use is positively associated with economic performance, while it shows no significant relationship with social impact.

The estimates of Models 2 and 4 show that non-financial management accounting practices positively affect economic performance, while in the case of social impact the effect is positive in both types of practices, financial and non-financial.

5. DISCUSSION

This work sheds light on the effect that management accounting practices have on the social impact and economic performance of organic farms. According to the results obtained, a greater use of management accounting practices is associated with higher levels of social impact and economic performance. It is also observed that the non-financial practices (indicator systems, benchmarking) are those that make the greatest contribution to social impact and economic performance. On the other hand, financial practices also positively affect the social impact of the farms. The results obtained seem to indicate that the degree of usefulness of management accounting practices on farms is to a certain extent explained by a series of contingent factors that characterize these productive units, such as their small size and their differentiation strategy.

Farmers tend to use more informal management accounting practices and often monitor their operations with indicators of various kinds including as nutrient balance, physical yields of animals and land, quality of forages, quality of production, and individual monitoring of the physical state and health of the animals. These indicators allow a comparison with the previous situation of the farm as well as with other farms and standards that are taken as points of reference. These non-financial practices contribute to the improvement of productive efficiency and thus to the improvement of economic performance.

The use of non-financial practices has also been documented on farms focused on commodity production rather than differentiated products. In this case, farmers have little bargaining power to reduce the prices of external inputs and final production, so they pay attention to management practices that can allow them to improve operational efficiency (Jakobsen, 2017). However, organic producers also make decisions about value related to the local environment and the marketing of the products, which requires greater interaction, negotiation and management of relationships with different stakeholders. Our results are in line with Gottlieb et al. (2017), which showed a significant impact of external stakeholders as carriers of logics into the farms. This influence relates to the intensity of interactions and the learning involved in them, and how both are enabled by management accounting practices. Stakeholders carry logics into organizations through the intensity of the interactions and the involved learning.

Generally, organic farmers have gone through a conversion process from a conventional system to organic certification. This decision already requires a prior analysis of the technical and economic effects that the conversion will have on the farm in the long term. Organic farmers usually have a strong motivation to achieve farm sustainability in all dimensions: economic, environmental and social. In the social sphere, it must be taken into account that the differentiation strategy of these farmers tries to integrate the resources of the local environment, many of them of an intangible nature, which allow them to add value to the final products and services. The resources available to farmers in rural areas, both material and immaterial (natural, social, cultural, heritage), can be used and recombined creatively to take advantage of new entrepreneurial opportunities (Korsgaard et al., 2015). Organic farms tend to have a higher level of local resource embeddedness (Müller and Korsgaard, 2018; Alvarez et al., 2021) than conventional farmers oriented to the production of agricultural commodities. Likewise, this strategy of differentiation is usually accompanied by the use of short marketing channels with an impact on the local environment (direct sales, shops, restaurants). In this context, the identification of business opportunities for the evaluation, implementation and monitoring of different marketing alternatives (product presentation, packaging, sales channels, distribution, pricing, etc.) requires the use of management accounting practices. In this differentiation strategy, based on local resources, farmers must not only worry about the efficiency of their agricultural production but must also address other commercial and administrative tasks that require them to manage both technical indicators as well as information of a financial nature. This, in turn, facilitates relations with different stakeholders such as clients, banks or even public administrations. The results of our estimates provide support for this reasoning, showing that the management accounting practices - both financial and non-financial - are positively associated whit social impact.

These activities have an impact on the local area in which the farms carry out their activity, since positive socio-economic effects are generated for other rural entrepreneurs in the activities of tourism, restaurants and local commerce, in addition to maintaining and promoting the way of rural life. Therefore, the high level of commitment of this type of farm to the local environment contributes to improving its level of resilience and probability of survival (Lobley et al., 2009).

ICT use constitutes a relevant tool for the implementation of management accounting practices. The results show a positive mediating effect of ICT between management accounting practices and economic performance, which can be understood as a positive contribution of ICT-based on-farm operational decisions. However, ICT use does not have a significant direct effect on the social impact of the farms, which reflects a failure by the farmers of the sample to make effective use of ICT in the application of their differentiation strategy linked to their local environment.

6. CONCLUSION

This study shows that the use of management accounting practices improves the economic performance and the social impact of organic farms. Our work makes several contributions. Firstly, this paper responds to recent calls for in-depth studies about the outcomes of management accounting practices in farm enterprises (Ndemewah et al., 2019). Secondly, we expand current research on the link between performance, management accounting and a strategy based on product differentiation through exploitation of local resources. From a theoretical point of view, our findings are in line with previous research, suggesting that companies that follow differentiation strategies may benefit from the use of newer management accounting practices (Chenhall and Langfield-Smith,1998a; López-Valeiras, 2015). The use of financial and non-financial practices contributes in a positive and significant way to the social impact of farms in the local environment.

The differentiation strategy of organic farms requires the appropriate skills to be able to deal with the multitasking. This work contributes to understand the role that management accounting practices play in a context in which innovations linked to the local environment are proposed that try to improve the profitability of farms while generating positive effects both in the economy and on the well-being of rural areas (Baumgartner et al., 2013).

This paper has several limitations. On the one hand, and as with previous studies in management accounting literature, this paper only considered a limited number of management accounting practices and used a general definition of each practice. Thus, the results should be interpreted with care. Future research may use more detailed definitions that allow identifying specific tools for improving the performance in the organic farm setting. Finally, the sample is relatively small and refers to the year 2019. In future work, it will be important to update our survey and thereby obtain a panel dataset, which would permit the evolution over the time to be incorporated.

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