The influence of accounting practices on financial performance

Evidence from French farms

Abstract

This paper examines the accounting practices of farms and their influence on their financial performance. In response to the production risks they face, farms have strong incentives to manipulate their earnings to achieve performance goals. This research is original in that it examines from a new perspective the financial management of risks by farms. The detection and measurement of accounting practices are based on six different dimensions: earnings quality, persistence, predictability, smoothness, timeliness and conservatism. We use data from the Farm Accountancy Data Network (FADN) which is representative of French professional farms over the period 2000-2020. Our results indicate that, on average, farms tend to decrease their earnings and their quality, regardless of the year and specialization. A direct consequence is a deterioration of their apparent profitability. However, this strategy is justified by the need for farms to reduce taxation, maintain their access to credit, and overcome climatic and economic shocks.

Keywords: Earnings management, Profitability, Risk management, Farms

1. Introduction

Farms are small businesses that are subject to many risks such as unfavorable weather, pests, volatile yields and prices, change in government policies, evolution of global markets. Each of these factors can lead to large variations in farm income (Finger and El Benni, 2021). Faced with uncertainty, farms must choose management strategies that preserve their economic viability (Darnhofer, 2014). In addition to technical or insurance solutions for risk mitigation, farms have also the ability to manage their financial flows (Wolf et al., 2016). This aspect of risk management has been very little studied, whereas earnings management is a strategy that has been broadly used by companies to reach predetermined targets.

In this paper, we intend to shed new light on the relationship between earnings quality and farm performance. Accrual-based earnings management and their economic consequences have been considered in various ways in the literature. According to Scott (2000), there are two different types of earnings management: "opportunistic earnings management", which is harmful, and "effective earnings management", which is profitable for the company. The "opportunistic" perspective is supported by some results (Burgstahler and Dichev, 1997; Balsam et al., 2002). Conversely, Gul et al. (2000) and Krishnan (2003) find that discretionary accruals are consistent with the "effective" perspective because they have a favorable and significant association with future profitability. Discretionary accruals can indeed inform the public about the future profitability of a firm (Ball and Shivakumar, 2005; Abdelghany, 2005; Dechow et al., 2010; Gaio and Raposo, 2011). It has been argued that high quality accounting information is a valuable means to counteract information asymmetry (Chen et al., 2012), in the sense of lower information risk and liquidity (Jo and Kim, 2007; Rajgopal and Venkatachalam, 2011). Firm performance and growth are then determined by the accuracy of financial information (Lee et al., 2006).

The literature highlights different earnings management practices between small (private) and large (public) companies. Small- and medium-sized companies (SMEs) have more space to manage the earnings because of the small size of their board (Chaganti and Mahajan, 1985). Without shareholder pressure, small companies are only subject to creditor monitoring. Consequently, access to credit is one of the most important reasons for SMEs to manage earnings. Studies specifically focusing on SMEs have shown that earnings are important for creditors and banks in assessing their creditworthiness (Maingot and Zeghal, 2006; Enjolras

and Madies, 2020). Thus, SMEs are interested to manage earnings to get a better loan acceptance (Kaplan, 2001; Riccardo and Rosati, 2022).

Small firms are also more likely to manage earnings to avoid reporting losses (Lee and Choi, 2002; Siregar and Utam, 2008) or to reduce tax payment (Mard and Vigneron, 2016). Managers of distressed firms are more likely to defer costs, to manage aggressively earnings, to revise upwards the estimates of assets useful lives or to adopt a new income increasing deprecation method (Franceschetti and Koschtial, 2013; Habib et al., 2013; Hassanpour and Ardakani, 2017; Kallunki and Martikainen, 1999; Tilden and Janes, 2012). In particular, they may artificially increase their earnings to avoid small loss (Burgstahler and Dichev, 1997) or engage in income-smoothing activities to make their activity's output more predictable (Coppens and Peek, 2005). Siregar and Utam (2008) show that family-owned businesses are more likely to select effective earnings management. One step further, researchers find out earnings management in the agricultural industry is greater than that in other industries because that the valuation of biologic assets leaves discretionary space to managers (Trejo-Pech et al., 2014; Li, 2017).

The aforementioned studies relate how earnings quality affect the company's future performance in different contexts. However, most of the literature regarding earnings management and earnings quality is focusing on listed or large companies. SMEs, and in particular farms and agribusiness, are less considered, probably due to their diverse nature and limited access to information. A research gap has yet to be filled by studying these companies. The interest in considering the agricultural sector is that it is very diverse because of the nature of the different animal and plant products. Moreover, it is very exposed to production and price risks that require a careful management of the results

In this paper, we are interested to measure the extent to which farms manage their accruals and the influence of earnings management and quality on their performance. To that aim, we define earnings quality as the extent to which reported earnings reflect operating fundamentals (Chen et al., 2004). We measure earnings quality in 6 dimensions: accruals quality (earnings management), persistence, predictability, smoothness, timeliness and conservatism (Barth et al., 2001; Schipper and Vincent, 2003; An, 2017). Regarding SMEs, farm performance is usually measured through the return on assets (ROA) (Dang et al., 2018; Duarte et al., 2022). We expect overall a positive relationship between earnings quality and farm performance. The

empirical analysis is based on data from the Farm Accountancy Data Network (FADN), an exhaustive database containing accounting, individual and structural information on a sample of French farms representative of size, production and regions. The time series covers the period from 2000 to 2020, representing a total of 155,335 observations. A set of panel-data regressions allow to measure the effects of earnings quality on farm performance.

Our result suggest that accruals quality, conservatism and timeliness are negatively related with ROA. Conversely, persistence, predictability and smoothness are positive related with ROA. The interpretation of these results shows that farms, like any other business, try to reduce their earnings through negative discretionary accruals. However, they should not compromise their access to credit, hence the need to smooth out their earnings. Finally, to overcome climatic and economic shocks and receive a direct support, they report their losses quickly. This contrasted picture is useful to understand how the accounting management supports farms in their risky environment. Reducing earnings quality harms farm performance while allowing them to get through the risks.

The remainder of this paper is organized as follows. Section 2 provides the theoretical background. Section 3 explains the methodology used in this paper. Section 4 displays and discusses the results. Section 5 concludes.

2. Theoretical background

2.1. Earnings quality and performance

For a company, earnings quality is a measure of the ability of earnings numbers to reflect a true performance and value (Dechow and Schrand, 2004). Chen et al. (2004) state that quality comes from the fact that reported earnings reflect operating fundamentals and do not differ from true earnings. The profit reported on the financial statements should accurately forecast future cash flows (Healy and Wahlen, 1999), with different implications.

Earnings quality are first considered as financial report quality proxy (Dechow and Dichev, 2002; Francis et al.; 2005; Rajgopal and Venkatachalam, 2011). They provide an adequate measure of the efficiency of the company's investments (Bushman and Smith, 2001) while being correlated to firm growth (Collins et al., 2016). A number of studies identify the positive

role of discretionary accruals in signaling future performance (Robin and Wu, 2015; Chen and Gong, 2019; Darmawan et al., 2019; Dechow et al., 2019). Discretionary accruals can then exert a positive signal effect (Pham et al., 2017) to reduce information asymmetries.

Earnings quality plays an originating effect in performance (Dechow et al., 1995; Tabassum et al., 2014; Huynh, 2019). Because earnings quality is related to managerial behavior, earnings manipulation has the ability to enhance the firm's credibility and reputation with stakeholders (Bartov et al., 2002; Burgstahler and Dichev 1997; Duarte et al., 2022). However, bad earnings quality can harm the organization's reputation, brand, and image, with a subsequent detrimental impact on the organization's upcoming earnings and financial performance (Berrone et al., 2007; Taylor and Xu, 2010; Leggett, et al., 2016). Anton (2019) suggests that discretionary accruals are used as earnings management tools and this practice is more used over a high-growth period, with ultimately negative effects on firm growth.

2.2. Earnings quality in SMEs

The motivations of SMEs to manipulate earnings can be very diverse. While large companies are under the pressure of meeting the benchmark settled by the market, board, stakeholders and regulators, SMEs are less concerned by these issues (Maingot and Zeghal, 2006). As for all companies, tax avoidance is a topic of great interest to SMEs and an important reason for them to manage their earnings (Ball et al., 2000; Sánchez-Ballesta and Yagüe, 2021). Mard and Vigneron (2016) pointed out more pronounced earnings downwards manipulation among private SMEs than among public ones, as a way to reduce tax payments in the French setting.

Access to credit has always been a challenge for SMEs (Maingot and Zeghal, 2006). Compared with large companies, SMEs are less diversified and therefore have less capacity to face risks. They choose to engage in income-smoothing activities to make their activity's output more predictable (Leuz et al., 2003), thus ensuring some stability before future loan applications (Bisogno et al., 2015). Studies specifically focusing on SMEs have shown that earnings, in particular stable cashflow and high predictability, are important for creditors and banks in assessing creditworthiness (García-Teruel et al., 2014; Enjolras and Madiès, 2020). It has been proved that firms manage their earnings to ameliorate their accounting portrait, thus achieving a better borrowing capacity and increasing their chance to obtain a loan (Riccardo and Rosati, 2022).

2.3. Research hypotheses

The literature has identified a set of relevant earnings quality measures: accruals quality (earnings management), persistence, predictability, smoothness, timeless and conservatism (Barth et al., 2001; Schipper and Vincent, 2003; Ball and Shivakumar, 2005; An, 2017; Duarte et al., 2022).

Abnormal accruals are the means of communicating private information within the accounting system (Dechow et al., 2010). Higher abnormal accruals reduce earnings quality and make firm performance less predictable, which in turn increases information asymmetry, reduce the firm's actual or perceived riskiness and finally leads to poor performance (García-Lara et al., 2009). However, discretionary accruals may be used as a communication tool to convey the firm's future profitability to the public (Siregar and Utama, 2008). The first hypothesis is then formulated as follows:

Hypothesis 1: Accruals quality is negatively related to the financial performance of farms.

Persistent earnings imply more permanent, more predictable, and less transitory earnings, so that financial statement users recognize them as high earnings quality (Francis and Schipper, 1996; Hung, 2000). Smoothness is a practice to reduce earnings fluctuations by shifting earnings from peak periods to years with less positive results (Goel and Thakor, 2003; Prencipe et al., 2011). Tucker and Zarowin (2006) indicate that the formativeness of earnings is increased by smoothing. However, García-Lara et al. (2009) show that income smoothing reduces the firm's actual or perceived riskiness, which would result in poorer returns for investors who choose to invest in lesser risk companies. Schipper and Vincent (2003) confirm that earnings smoothness improves the persistence and predictability of reported earnings. Thus, higher persistence, predictability, and smoothness improve the firm's stability, leading to the good performance in the long term (Graham et al., 2005). The second hypothesis is therefore formulated as follows:

Hypothesis 2: Persistence, predictability and smoothness are positively related to financial performance of farms.

Earnings timeliness is related to the moment financial information is available. Financial information should be available to users in due time to be relevant (Brown et al. 2011). However, managers may adopt practices to delay or advance information, which can result in a loss of quality. Their interest is to keep a flexibility to manage their earnings, especially in case of bad news (Ball et al., 2000). Conservatism enhances the transparency of financial statements since it limits managerial opportunistic behavior and offsets managerial biases through asymmetric financial information (Watts, 2003). In a more conservative accounting practice, bad news is recognized in earnings earlier and with greater extension than good news, which are recognized later and more gradually (Basu, 1997; Givoly and Hayn, 2002; Chen et al., 2014). Therefore, a higher level of earnings timeliness and conservatism reduces information asymmetry but at the expense of the company's immediate performance (Basu, 1997; Chen et al., 2014). The third hypothesis is then formulated as follows:

Hypothesis 3: Earnings timeliness and conservatism are negatively related to financial performance of farms.

3. Empirical strategy

3.1. Data

The hypotheses presented in the previous section are tested on a sample of small and medium-sized active farms operating in France, which were selected from the Farm Accountancy Data Network (FADN). This exhaustive database contains accounting, individual and structural information on a sample of French farms representative of size, production and regions. The time series covers the period from 2000 to 2020, representing the oldest and most recent years available on French FADN at the time of data collection (more than 7,000 farms surveyed each year, 155,335 observations in total).

According to the 2019 Agricultural Census, France had approximately 416,000 farms on which 583,000 people worked. Farms are very diversified and their activities can be divided into main productions (field crops, market gardening, wine growing, fruits, livestock, poultry, mixed productions) with specific dynamics. For instance, field crop, fruit and vegetable producers are exposed to weather hazards which threaten their yields. All productions are also exposed to specific diseases and pests as well as price volatility. Farm revenue and income are thus subject to a strong variability and farm performance changes accordingly.

Starting from these base measures, we compute for each farm *i* and year *t* for rolling 10-year periods t-9 to t the earnings quality indicators. Insofar as our sample is not balanced due to a rotation of surveyed farms, the number of available observations drops to 6,132 farms, 90,303 in total.

3.2. Measures of earnings quality

Abdelghany (2005) suggests that at least three different approaches should be adopted to measure earnings quality. In this paper, we consider a set of eight indicators to check for earnings quality - abnormal accruals, accruals quality, persistence, predictability, smoothness (with 2 measures), timeliness and conservatism - all of which are grounded in the literature (Dechow et al., 2010; Perotti and Wagenhoffer, 2014; Duarte et al., 2022). A summary description of the main variables is given in Table 1 and the definition of the earnings quality measures in Table 2.

Table 1. Definition of the main variables

Table 2. Measures of earnings quality

Total accruals (TA) are calculated according to the balance-sheet-approach (Jones, 1991):

$$TA_{i,t} = \Delta CA_{i,t} - \Delta CL_{i,t} - \Delta Cash_{i,t} + \Delta STD_{i,t} - \Delta Dep_{i,t} \quad (1)$$

Where ΔCA is the change in current assets, ΔCL is the change in current liabilities, ΔCash is the change in cash and equivalents, ΔSTD is the change in short-term debts and ΔDep is the change in depreciations, i and t are respectively individual and fiscal year indicators.

Current accruals (CACC) are computed as:

$$CACC_{i,t} = \Delta CA_{i,t} - \Delta CL_{i,t} - \Delta Cash_{i,t} + \Delta STD_{i,t} \quad (2)$$

Cash-flows from operations (CFO) are calculated in the following way:

$$CFO_{i,t} = \mathrm{NIBE}_{i,t} - \mathrm{ACC}_{i,t} \quad (3)$$

Where NIBE is a base earnings measure defined as net income before extraordinary items.

Accruals quality

Abnormal accruals are estimated through the Dechow et al. (1995) model, measured as the absolute value of residuals multiplied by -1.

$$\frac{ACC_{i,t}}{A_{i,t-1}} = \alpha_i + \beta_{1i}\left(\frac{\Delta REV_{i,t}}{A_{i,t-1}} - \frac{\Delta \mathrm{AR}_{i,t}}{A_{i,t-1}}\right) + \beta_{2i}\frac{PPE_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (4)$$

$$Abnormal\ accruals_i = -\left|\varepsilon_{i,t}\right| \quad (5)$$

Where A_{t-1} are lagged assets, ΔREV is the change in revenues, ΔAR is the change in accounts receivables and PPE is the gross property, plant and equipment.

Accruals quality is a good proxy of earnings quality (Schipper and Vincent, 2003) since accruals quality represents the faithfulness of financial reporting. In this work, Accruals quality is estimated through the following regression. Accruals quality is measured as the standard deviation of residuals multiplied by -1.

$$\frac{CACC_{i,t}}{A_{i,t-1}} = \alpha_i + \beta_{1i}\left(\frac{\Delta CFO_{i,t}}{A_{i,t-1}}\right) + \beta_{2i}\left(\frac{\Delta CFO_{i,t}}{A_{i,t-1}}\right) + \beta_{3i}\left(\frac{\Delta CFO_{i,t+1}}{A_{i,t-1}}\right) + \varepsilon_{i,t} \quad (6)$$

$$Accruals\ quality_i = -\sigma(\varepsilon_{i,t}) \quad (7)$$

High values of *Abnormal accruals* and *Accruals quality* are generally associated with a high earnings quality.

Persistence

Persistence which is a first time-series measure for earnings quality is equal to the estimated β coefficient of the following linear regression. Persistent earnings (β close to 1) tend to be repeated in the future, providing evidence of their quality. Seasonal effects ($\beta < 0$) can also be identified.

$$\frac{NIBE_{i,t}}{A_{i,t-1}} = \alpha_i + \beta_i \frac{NIBE_{i,t-1}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (8)$$

$$Persistence_i = \beta_i \quad (9)$$

Financial information users recognize highly persistent earnings as sustainable, less transitory, and more stable (Richardson et al., 2003). Therefore, large (small) values of the slope-coefficient β_1 correspond to more (less) persistence.

Predictability

Predictability is the coefficient of determination (R^2) of equation (8). A high coefficient is related to a high quality of earnings.

$$Predictability_i = R_i^2 \tag{10}$$

Smoothness

Smoothness1 is the ratio of the standard deviation of NIBE over the standard deviation of CFO:

$$Smoothness_{1i} = \sigma\left(\frac{NIBE_{i,t}}{A_{i,t-1}}\right) / \sigma\left(\frac{CFO_{i,t}}{A_{i,t-1}}\right) \tag{11}$$

Smoothness2 can be determined through the correlation of ACC and CFO:

$$Smoothness_{2i} = \rho\left(\frac{ACC_{i,t}}{A_{i,t-1}}; \frac{CFO_{i,t}}{A_{i,t-1}}\right) \tag{12}$$

The more the absolute values of *Smoothness1* and *Smoothness2* are important, the more the smoothing effect is pronounced and the lower is the earnings quality. Financial analysts and investor's view volatility of earnings as undesirable and indicative of a low quality of earnings (e.g., Dechow, 1994; Dechow et al., 1998).

Timeliness

Timeliness is the coefficient of determination (R^2) of equation (13). A high coefficient is related to a high quality of earnings, which reflects quickly the cash flow information (Brown et al. 2011):

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_i + \beta_1 DCFO_{i,t} + \beta_2\left(\frac{CFO_{i,t}}{A_{i,t-1}}\right) + \beta_3 DCFO_{i,t}\left(\frac{CFO_{i,t}}{A_{i,t-1}}\right) + \varepsilon_{i,t} \tag{13}$$

$$Timeliness_i = R_i^2 \tag{14}$$

Where DCFO is a dummy variable which takes the value 1 if CFO are strictly negative (bad news) and 0 if CFO are positive (good news).

Conservatism

Conservatism is computed from the estimation of the coefficients of equation (13). A high value is associated to a high earnings quality (Basu, 1997).

$$Conservatism_i = \frac{\beta_2+\beta_3}{\beta_2} \quad (15)$$

3.3. Measure of performance

The performance of companies can be measured with several indicators that are either accounting-based or market-based. In the case of SMEs, only the former is relevant. Following the literature, we therefore choose the most generally adopted indicator which is the return on assets (ROA) (Kothari et al., 2005; Lee et al., 2006; Latif et al., 2017; Dang et al., 2018; Duarte et al., 2022). Other accepted indicators such as the return on equity and operating profit margin are usually less considered.

For firm i in year t, the ROA is defined as:

$$ROA_{i,t} = \frac{Net\ income_{i,t}}{Total\ assets_{i,t}} \quad (16)$$

ROA is a proxy for measuring the overall efficiency with which firm assets are used to produce net income from operations. In addition, ROA can be used to compare the efficiency of capital use in one's business with others in the same sector. Finally, this indicator is commonly used by banks to accept or reject credit applications (García-Teruel et al., 2014).

3.4. Control variables

Size is usually considered as a key factor influencing business performance (Kokko and Sjoholm, 2004). On the one hand, size allows the company to optimize its cost structure and benefit from economies of scale (Latif et al., 2017). Large firms are also more competitive than small ones, as they have a large market and therefore the opportunity to make higher profits (Darmawan and Toro, 2012). On the other hand, smaller companies may be more efficient when focused on a single market (Margaretha and Supartika, 2016).

Leverage represents both an opportunity and a constraint for SMEs, and in all cases a source of risk (Grau and Reig, 2021). On the one hand, indebtedness opens up investment opportunities that are needed to generate profits and it puts some positive pressure on the company's financial management by encouraging the efficient use of resources. On the other hand, debt repayment and interests represent a strong long-term commitment and reduce the results in the short-term. In the French context, the variance of firm performance is higher if firms are highly leveraged (Gharsalli, 2019). From a theoretical perspective, the divergence in results can be partly explained by competing theories such as signaling theory, which postulates that debt, in the presence of asymmetric information, should be positively related to firm performance, and agency cost theory which predicts a negative relationship between leverage and firm performance as a result of agency costs between firm owners and lenders (Ibhagui and Olokoyo, 2018).

Growth measures sales growth and more generally the development of the company. On the one hand, growth translates into the development of certain activities and therefore the perspective of greater profitability (Latif et al., 2017). Growing firms can also generate more profit from their investments (Zeitun and Tian, 2007). On the other hand, unrestrained growth can be coupled with cost drift and therefore a decrease in profitability (Yazdanfar and Öhman, 2015).

Tax regime is an important variable insofar as the calculation of the tax has a direct impact on the company's performance and value (Assidi et al., 2016). Income from farm activities in France can be subject to 3 tax methods depending on the farm's revenue and the options chosen by the farmer. The farm can then reduce his tax and increase his profitability by adopting the most advantageous tax regime for him.

Legal form is a significant determinant of performance. Companies organize themselves in different forms, individual or collective, in order to optimize their sustainability (Hart and Milstein, 2003). Farms are distributed between individual and collective companies with the aim of accessing better resources and larger investments, while increasing their capacity to resist risks.

Specialization has a direct impact on their level of profitability due to sectoral differences. The agricultural sector is a good illustration as it encompasses activities with high profitability such as market gardening with activities with low profitability such as cattle breeding (European Commission, 2021).

3.5. Econometric models

Our statistical approach relies on the estimation of econometric models in panel data with variable effects. Fixed effects cannot be considered because most earnings quality variables are time-invariant. In order to ensure the robustness of estimates, standard errors are adjusted for within-farm correlation (Petersen, 2009). Given the correlation between earnings quality indicators (Table 5), each model regresses performance (ROA) on a single earnings quality indicator as well as on control variables. The general form of the models is as follows:

$$Performance_{i,t} = \beta_0 + \beta_1 EQ_{i,t} + \beta_2 Size_{i,t} + \beta_3 Leverage_{i,t} + \beta_4 Growth_{i,t} + \beta_5 Tax_{i,t} + \beta_6 Legal_{i,t} + \beta_7 Specialization_{i,t} + \varepsilon_{i,t} + \quad (17)$$

Where: Performance is the farm's ROA, EQ is a measure of earnings quality (among abnormal accruals, accruals quality, persistence, predictability, smoothness, timeliness and conservatism), Size is the farm's size, Leverage is the farm's leverage, Growth is the farm's growth, Tax is the farm's tax regime, Legal is the farm's legal status, Specialization is the farm's main production, β are the estimated parameters, ε is the error term, i and t are respectively individual and fiscal year indicators.

4. Results

4.1. Descriptive statistics

Because of the geographical and sectoral representativeness of the sample, farms are located throughout metropolitan France. They are more numerous in the South of France where production is predominantly fruits, vegetables and wine than in the North of France where production is predominantly field crops. Cattle breeding, animal by-products (milk, eggs) and mixed productions are spread throughout the country.

Individual farms represent almost half of our sample (48%). The other half of the farms are divided into common farming groups (“Groupement Agricole d'Exploitation en Commun - GAEC”, 19%) and limited liability farms (“Exploitation Agricole à Responsabilité Limitée - EARL”, 27%), which allow farmers to invest together as a family or with partners. Depending on their production and income, farms opt for different tax regimes. A minority of farms (14%) are subject to a flat tax ("Régime micro-BA"). Half of the farms (49%) are taxed under the simplified real regime ("Régime réel simplifié") and the rest (36%) under the real regime ("Régime réel").

At an economic level, the agricultural sector is on the whole not very dynamic (Figure 1). Average growth over the period 2000-2020 is generally between 0% and 3.5%. To finance their investments, farmers traditionally use bank debt. Leverage has increased slightly from 38.5% in 2000 to 41% in 2020. In spite of significant investments that result in high assets (Table 3), the agricultural sector is progressively losing competitiveness, since the ROA is gradually decreasing with ups and downs. It drops from 15% in 2000 to 12% in 2020.

Table 3. Descriptive statistics of the main variables

Figure 1. Economic and financial dynamism of French farms

Figure 2 also shows that there are strong sectoral disparities. The sectors where farms are most profitable (field crops, market gardening) or most dynamic (poultry) are the most indebted.

Figure 2. Economic and financial situation of French farms by specialization

Faced with increasing risks (price volatility, decreasing profitability), it is not surprising that farmers implement earnings management strategies at the expense of the quality of their earnings (Table 4). Almost all farmers downward their earnings (average value of -0.0734, median value of -0,0483). They do so in a more pronounced way than listed companies (Perotti and Wagenhoffer, 2014) or other industrial SMEs (Duarte et al., 2022). Earnings persistence has an average of 0.2717 and earnings predictability 0.1567, which is quite low but must be related to the risky production conditions with uncontrollable factors such as weather. For this reason, farms actively engage in smoothing practices (-0,7114 or 0.7114 on average depending on the indicator), which preserves their ability to deal with future risky situations. Finally, farms do not quickly reflect cash flow information (average timeliness of 0.4138). However, they are conservative in their accounting practices (average of 0.9850), which means that they recognize bad news faster than good news.

Table 4. Descriptive statistics of earnings quality measures

Moreover, Table 5 shows that all earnings quality indicators are generally corelated with a high degree of significance at the 1% level, although most of them are numerically small. Such correlations are consistent with the results of Francis et al. (2004) and subsequent works. On its own, the degree of conservatism seems to be uncorrelated with other indicators. The most correlated variables are Abnormal accruals and Accruals quality (0.420***), Persistence and Predictability (0.711***), Smoothness1 and Smothness2 (0,877***), which results from their intrinsic relationship. In line with Duarte et al. (2022), the strong negative correlation between Smoothness and Timeliness (-0,582*** or -0,633*** depending on the indicator), suggests that farms use earnings management practices to smooth their earnings, but at the same time, incorporate accounting information in their earnings.

Table 5. Correlation of earnings quality measures

While most earnings quality indicators remain stable, Figure 3 shows that conservatism has increased steadily over 20 years. Arguably, when faced with more recurrent shocks, farmers have an incentive to transcribe bad news more quickly. This strategy is not without ulterior motives insofar as government aid is paid on an *ad hoc* basis to sectors experiencing strong crises (agricultural disasters, rising energy prices).

Figure 3. Evolution of earnings quality indicators of French farms

Figure 4 shows that differences in profitability, growth and debt are reflected in earnings quality. The more profitable the farms are, the more they implement earnings management strategies with smoothing or conservatism effects. These are probably defensive strategies aimed at preserving the capacity of farms to face future difficulties. It is interesting to note that these practices are present across all agricultural productions, their extent depending on the health of each specialization.

Figure 4. Earnings quality indicators of French farms by specialization

Table 6 displays the farm's ROA with the highest and lowest values of the respective earnings quality measure, the value for the 4st quartile and the 1st quartile, and a significance test for the difference between the two.

Table 6. Distribution of the ROA according to earnings quality measures

We first notice that a high ROA is associated with low abnormal accruals, in accordance with the literature mentioned above (Leuz et al., 2003). The ROA is also higher for accruals timeliness and conservatism. The smaller the abnormal accruals, the more effectively stakeholder are able to allocate resources to improve performance (Dang et al., 2020). Regardless of the time period in which the effects of bad news occur, conservative and timeliness firms recognize it immediately and completely. Bad news thus become a transitory component of performance (Chen et al., 2014). Conversely, persistence, predictability and smoothness are positively related to ROA. As Hung (2001) suggests, highly persistent earnings are more permanent and less transitory so that financial statement users recognize them as high earnings quality. In turn, this predictability of reported earnings can help capital and debt providers, as well as managers, make effective decisions, further improving firm performance (Schipper and Vincent, 2003).

4.2. Econometric analysis

Table 7 displays the results of regressions measuring the influence of earnings quality on ROA. These results are broadly consistent with Table 6. They show that abnormal accruals, accruals quality and accruals timeliness negatively influence the ROA. Conversely, persistence, predictability and smoothness have a positive influence on ROA. Conservatism, however, has no effect on the ROA.

Table 7. Results of the econometric estimations

Looking more closely at our results, farms engage in downward earnings management over a long period. In France, the farm tax system is based on the level of income. Therefore, farmers are motivated to reduce the quality of accruals and benefit from tax savings. It is not surprising that the ROA decreases since farms have already minimized their profits in their reporting, thus validating Hypothesis 1.

Faced with inherently risky modes of production, farms must maintain their profitability at a certain level. This objective aims on the one hand to ensure the sustainability of their business. It also aims to maintain their access to credit. As we know from Table 3, farms have a debt-to-equity ratio of 41.66%, which makes them very dependent on their creditors. Stable cash flows and less volatile performance over time improve the image of farms with banks and increase their chances of obtaining future loans. As a result, farms use these accounting management techniques to increase their performance, thus validating Hypothesis 2.

The appearance of bad news directly harms the farms' performance if they are immediately reported in the accounts. It is therefore not surprising that farms avoid using them. They may, however, be encouraged to do so in severe circumstances such as agricultural disasters. The agricultural sector being strategic for food, it benefits from a high level of public support. While most of these are independent of the level of production, some are reserved for situations that threaten the viability of farms. As shown in Figure 3, the succession of crises leads farmers to be more conservative, probably with the objective of receiving these production-indexed payments more easily. This may explain the non-significance of conservatism in the econometric models, which only partially validates Hypothesis 3.

With respect to control variables, farm size negatively impacts financial performance, confirming that small farms are less efficient with respect to their means of production. If their size decreases their risk, it also decreases their profitability (Margaretha and Supartika, 2016). Firms' indebtedness decreases financial performance, probably due to important debt obligations (Dang et al., 2020). Finally, we observe that growth opportunities affect positively performance, which is likely explained by the fact that growing firms have access to more resources (Latif et al., 2017). Regarding the tax regime, farms with a flat rate are the least profitable. This tax system was historically designed not to penalize small and less profitable businesses. Similarly, the legal forms of collective organization largely benefit the profitability of concerned farms. They offer them real advantages to invest more and thus develop their activity. Finally, as farms are very diverse, some sectors are more likely to be profitable such as market gardening (high value added). Other specializations are disadvantaged, such as wine-growing (high level of investments) or cattle breeding (low margins).

In order to ensure the robustness of our results, we complement our regression models with quantile regressions using the method of moments. This estimation technique is suitable in our case given that fixed effects cannot be considered with time-invariant earnings quality variables (Machado and Santos Silva, 2019). An illustration is given for "predictability" as a measure of earnings quality, along with a 95% confidence interval for the total sample of French farms (Figure 5).

Figure 5. Results of the quantile regressions for earnings predictability

It can be seen that ROA consistently increases with earnings predictability across the quantiles, in line with Table 6. While size has an inverse effect on profitability, leverage and growth increase it. For these key variables, the results confirm and strengthen those of panel regressions (Table 7). The same applies for other control variables (tax regime, legal form, farm specialization). Finally, the shape and slope of the graphs confirm the non-significance of other tax regime, other legal form and specialization in poultry, which aligns with the findings in the main models.

5. Conclusion

The purpose of this paper was to examine the consequence of farm engagement in earnings management, and specifically the relationship between earnings quality and farm performance. Farms belong to a risky sector for which the accounting management of earnings is likely to offer a significant added value for their sustainability. In order to analyze the quality of farm earnings, we considered independent dimensions: abnormal accruals, accruals quality, persistence, predictability, smoothness, timeliness, and conservatism. Our empirical analysis relied on the Farm Accountancy Data Network (FADN), which is representative of professional French farms from 2000 to 2020.

Our findings show first that farms reduce their earnings and lower the quality of their earnings throughout the period and for all specializations. This strategy reduces their profitability, with the probable objective of reducing their taxes. Second, we show that farms have quite persistent, predictable and smoothed earnings, which increases their profitability. Such choice offers them two advantages: smoothing out their income in order to face uncertain production and market conditions, and at the same time retaining access to credit because they heavily rely on bank financing for their projects. For this reason, farms avoid immediate reporting of bad news as it harms their profitability. However, they adopt conservative accounting practices, probably in order to receive government aid quickly in case of an adverse situation, such as a natural disaster or a plague epidemic.

These results shed new light on the observed decline in farm profitability and their ability to face risks. Accounting practices play an important role in supporting farmers in risky production and volatile market conditions. Farmers can thus mitigate the effects on their financial situation of adverse climatic events or cycles in energy or agricultural commodity prices. While the situation of farms may seem difficult at first glance due to reduced and low-quality earnings, we believe that they are in fact resilient in ensuring the sustainability of their activity and their financing.

Further research could provide more precise evidence of the impact of climatic, geopolitical or market events on farm accounting practices. Similarly, our analysis could be extended to other performance indicators, including additional profitability measures or agricultural performance measures such as the purchase of insurance products or environmentally friendly practices. Finally, this work could be applied to other SMEs whose size and structure make them similarly vulnerable to different kinds of risks and yet are very little studied.

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Table 1. Definition of the main variables

Variable	Measure
Earnings quality measures	
CA	Current assets (€)
CL	Current liabilities (€)
Cash	Cash and equivalents (€)
STD	Short term debt (€)
A	Total assets (€)
Dep	Depreciations (€)
ACC	Total accruals (€): $TA_{i,t} = \Delta CA_{i,t} - \Delta CL_{i,t} - \Delta Cash_{i,t} + \Delta STD_{i,t} - \Delta Dep_{i,t}$
CACC	Current accruals (€): $CACC_{i,t} = \Delta CA_{i,t} - \Delta CL_{i,t} - \Delta Cash_{i,t} + \Delta STD_{i,t}$
NIBE	Net income before extraordinary items (€)
CFO	Cash-flows from operations (€): $CFO_{i,t} = \mathrm{NIBE}_{i,t} - \mathrm{ACC}_{i,t}$
Performance measure	
ROA	Return on assets (%): $ROA_{i,t} = \frac{\text{Net income}_{i,t}}{\text{Total assets}_{i,t}}$
Natural drivers à performance	
Size	Total assets (€) (ln)
Leverage	Total liabilities divided by equity book value (%)
Growth	Change in production (%)
Control variables	
Tax regime	Classes: Flat tax, Simplified real (option), Simplified real (mandatory), Real (option), Real (mandatory), Other tax regime
Legal status	Individual farm, Common farming group (GAEC), Limited liability farm (GAEC), Other legal form
Farm specialization	Classes: Field crops, Market gardening, Wine-growing, Fruits , Cattle, Poultry, Mixed

Key: Δ denotes an annual variation, i is the farm index and t the year.

Notes:
- All data come from the French Farm Accountancy Data Network (FADN) 2000-2020.
- Additional information on the tax regime for French farms can be found on the website of the Ministry of Economy: https://www.economie.gouv.fr/entreprises/impot-sur-revenu-benefices-agricoles-ba
- Additional information on the legal status for French farms can be found on the website of the Ministry of Agriculture: https://agriculture.gouv.fr/exploitations-agricoles-structures-et-statuts

Table 2. Measures of earnings quality

Measure	Definition
Abnormal accruals	$-\lvert\varepsilon_{i,t}\rvert$ from $\frac{ACC_{i,t}}{A_{i,t-1}} = \alpha_i + \beta_{1i}\left(\frac{\Delta REV_{i,t}}{A_{i,t-1}} - \frac{\Delta \mathrm{AR}_{i,t}}{A_{i,t-1}}\right) + \beta_{2i}\frac{PPE_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t}$
Accruals quality	$-\sigma(\varepsilon_{i,t})$ from $\frac{CACC_{i,t}}{A_{i,t-1}} = \alpha_i + \beta_{1i}\left(\frac{\Delta CFO_{i,t}}{A_{i,t-1}}\right) + \beta_{2i}\left(\frac{\Delta CFO_{i,t}}{A_{i,t-1}}\right) + \beta_{3i}\left(\frac{\Delta CFO_{i,t+1}}{A_{i,t-1}}\right) + \varepsilon_{i,t}$
Persistence	β_i from $\frac{NIBE_{i,t}}{A_{i,t-1}} = \alpha_i + \beta_i\frac{NIBE_{i,t-1}}{A_{i,t-1}} + \varepsilon_{i,t}$
Predictability	R_i^2 from previous equation
Smoothness1	$\sigma\left(\frac{NIBE_{i,t}}{A_{i,t-1}}\right)/\sigma\left(\frac{CFO_{i,t}}{A_{i,t-1}}\right)$
Smoothness2	$\rho\left(\frac{ACC_{i,t}}{A_{i,t-1}};\frac{CFO_{i,t}}{A_{i,t-1}}\right)$
Timeliness	R_i^2 from $\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_i + \beta_1 DCFO_{i,t} + \beta_2\left(\frac{CFO_{i,t}}{A_{i,t-1}}\right) + \beta_3 DCFO_{i,t}\left(\frac{CFO_{i,t}}{A_{i,t-1}}\right) + \varepsilon_{i,t}$
Conservatism	$\frac{\beta_2+\beta_3}{\beta_2}$ from previous equation

Key: β are estimated parameters from the regression, ε are error terms from the regressions, ϱ is a correlation coefficient, σ is a correlation coefficient, R^2 is a coefficient of determination, i is the farm index and t the year. All variables are defined in Table 1.

Table 3. Descriptive statistics of the main variables

Variables	Mean	Std. Dev.	10%	25%	50%	75%	90%
NIBE	0.1258	0.1461	-0.0112	0.0101	0.0984	0.1774	0.2905
CFO	0.1964	0.1958	0.0097	0.0917	0.1717	0.2733	0.4157
ACC	-0.0699	0.1457	-0.2262	-0.1376	-0.0709	-0.0060	0.0814
CACC	0.0125	0.1336	-0.1200	-0.0463	0.0044	0.0612	0.1513
PPE	0.6142	0.2138	0.3182	0.4835	0.6356	0.7537	0.8537
ΔREV	0.0098	0.1323	-0.1184	-0.0420	0.0080	0.0611	0.1423
ΔAR	0.0023	0.0969	-0.0940	-0.0377	-0.0001	0.0387	0.1004
ROA	0.1365	0.1453	0.0009	0.0527	0.1111	0.1882	0.2966
Assets	12.6900	0.7844	11.6740	12.2079	12.7231	13.2072	13.6568
Leverage	0.4166	0.2834	0.0930	0.2070	0.3710	0.5701	0.7844
Growth	0.0235	0.1454	-0.0869	-0.0261	0.0011	0.0486	0.1516

Key: The table reports the mean, standard deviation, the 10th, 25th, 50th, 75th and 90th percentiles for the main variables used. All data come from the French Farm Accountancy Data Network (FADN). The original sample period covers years 2000-2020 and comprises 155,335 observations. All variables are defined in Table 1 and winsorized at the 1% level to control for outliers.

Table 4. Descriptive statistics of earnings quality measures

Variables	Mean	Std. Dev.	10%	25%	50%	75%	90%
(1) Abnormal accruals	-0.0734	0.0790	-0.1686	-0.0964	-0.0483	-0.0210	-0.0081
(2) Accruals quality	-0.0671	0.0422	-0.1233	-0.0850	-0.0569	-0.0374	-0.0246
(3) Persistence	0.2717	0.3547	-0.2027	0.0034	0.2789	0.5204	0.7303
(4) Predictability	0.1567	0.1764	0.0032	0.0216	0.0874	0.2370	0.4248
(5) Smoothness1	0.7142	0.3387	0.3286	0.4743	0.6662	0.8932	1.1308
(6) Smoothness2	-0.7114	0.2449	-0.9508	-0.8949	-0.7855	-0.5938	-0.3617
(7) Timeliness	0.4138	0.2669	0.0545	0.1819	0.3984	0.6320	0.7903
(8) Conservatism	0.9850	7.9425	-0.2442	1.0000	1.0000	1.0000	2.3877

Key: The table reports the mean, standard deviation, the 10th, 25th, 50th, 75th and 90th percentiles for the earnings quality measures. All data come from the French Farm Accountancy Data Network (FADN). All variables are defined in Table 1 and winsorized at the 1% level to control for outliers.

Table 5. Correlation of earnings quality measures

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Abnormal accruals	1.000							
(2) Accruals quality	0.420***	1.000						
(3) Persistence	0.034***	0.037***	1.000					
(4) Predictability	0.028***	0.026***	0.711***	1.000				
(5) Smoothness1	0.081***	-0.036***	0.017***	0.056***	1.000			
(6) Smoothness2	0.099***	0.003	0.108***	0.134***	0.877***	1.000		
(7) Timeliness	-0.025***	0.001	-0.074***	-0.062***	-0.582***	-0.633***	1.000	
(8) Conservatism	-0.011***	-0.013***	-0.001	0.006	0.009***	0.002	-0.008*	1.000
*** p<0.01, ** p<0.05, * p<0.1								

Key: The table displays pairwise correlations and reports Pearson correlation coefficients between earnings quality measures. *, ** and *** respectively denote significance at the 1%, 5% and 10% levels. All data come from the French Farm Accountancy Data Network (FADN). All variables are defined in Table 1 and winsorized at the 1% level to control for outliers.

Table 6. Distribution of the ROA according to earnings quality measures

Variables	1st quantile	4th quantile	Difference	t-statistics
(1) Abnormal accruals	16.00%	11.94%	4.06	28.1388***
(2) Accruals quality	17.50%	10.48%	7.02	50.6762***
(3) Persistence	11.64%	17.22%	-5.58	28.1388***
(4) Predictability	12.03%	16.44%	-4.41	-31.8230***
(5) Smoothness1	10.28%	16.31%	-6.03	-46.8666***
(6) Smoothness2	10.45%	17.18%	-6.73	-50.3978***
(7) Timeliness	16.51%	11.42%	5.09	36.8192***
(8) Conservatism	14.08%	9.92%	4.16	32.5369***

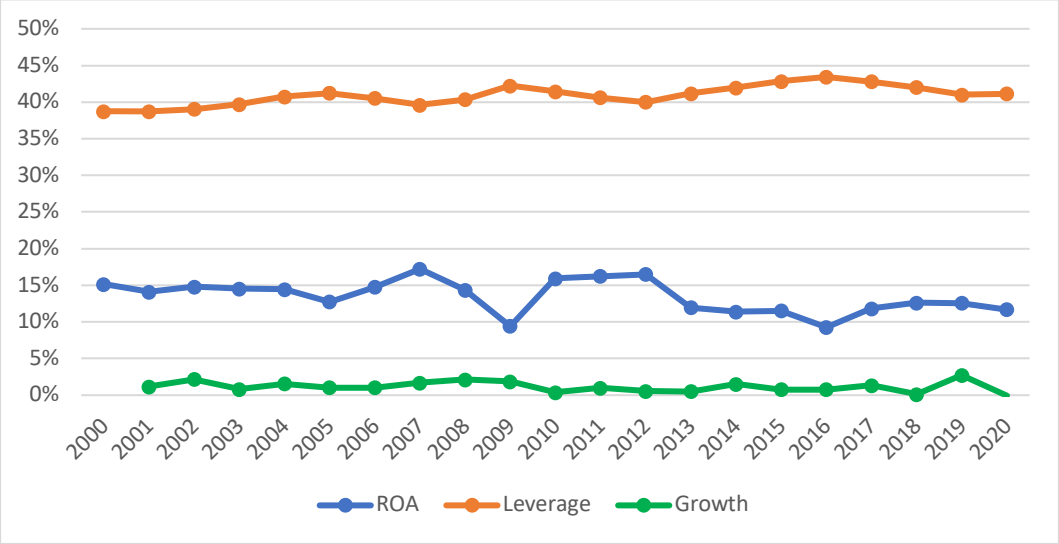
Key: The table presents annual ROA by earnings quality measure. The difference between the first and the fourth quantiles is computed and tested using a t-test. *, ** and *** respectively denote significance at the 1%, 5% and 10% levels. All data come from the French Farm Accountancy Data Network (FADN). All variables are defined in Table 1 and winsorized at the 1% level to control for outliers.

Table 7. Results of the econometric estimations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Earnings quality								
(1) Abnormal accruals	-0.077***							
(2) Accruals quality		-0.504***						
(3) Persistence			0.049***					
(4) Predictability				0.099***				
(5) Smoothness1					0.023***			
(6) Smoothness2						0.056***		
(7) Timeliness							-0.048***	
(8) Conservatism								0.001
Firm characteristics								
Size	-0.062***	-0.060***	-0.063***	-0.063***	-0.063***	-0.062***	-0.063***	-0.063***
Leverage	-0.123***	-0.126***	-0.118***	-0.118***	-0.117***	-0.115***	-0.119***	-0.119***
Growth	0.030***	0.029***	0.030***	0.030***	0.030***	0.030***	0.030***	0.030***
Tax regime (Ref: Flat rate)								
Simplified real (option)	0.005	0.005	0.008*	0.008*	0.009*	0.011**	0.010*	0.007
Simplified real (mandatory)	0.011***	0.009**	0.011***	0.011***	0.013***	0.015***	0.013***	0.011***
Real (option)	0.016***	0.013***	0.018***	0.018***	0.019***	0.021***	0.018***	0.017***
Real (mandatory)	0.022***	0.019***	0.022***	0.023***	0.025***	0.027***	0.024***	0.023***
Other	0.014	0.014	0.016	0.017	0.016	0.018	0.016	0.014
Legal form (Ref: Individual farm)								
Common farming group	0.078***	0.072***	0.077***	0.079***	0.080***	0.080***	0.080***	0.079***
Limited liability farm	0.044***	0.038***	0.044***	0.045***	0.046***	0.047***	0.046***	0.046***
Other	0.036	0.029***	0.037***	0.038***	0.038***	0.039***	0.038***	0.037***
Farm specialization (ref: Field crops)								
Market gardening	0.061***	0.058***	0.059***	0.056***	0.061***	0.059***	0.060***	0.061***
Wine growing	-0.018***	-0.016***	-0.014***	-0.016***	-0.022***	-0.022***	-0.020***	-0.018***
Fruits	0.013*	0.011	0.018**	0.015**	0.011	0.010	0.012	0.013*
Cattle	-0.025***	-0.015***	-0.027***	-0.028***	-0.025***	-0.025***	-0.026***	-0.026***
Poultry	0.001	0.003	-0.001	-0.003	0.001	0.001	-0.001	-0.001
Mixed	-0.009***	-0.004	-0.011***	-0.011***	-0.010***	-0.010***	-0.011***	-0.010***
Intercept	0.947***	0.897***	0.953***	0.948***	0.945***	0.986***	0.977***	0.970***
Region	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	84,006	84,006	84,006	84,006	84,006	84,006	84,006	84,006
R^2	0.2154	0.2215	0.2268	0.2259	0.2147	0.2215	0.2189	0.2110
Chi^2	5311.509	5404.34	5442.235	5409.25	5325.965	5383.492	5398.013	5235.231
Prob>Chi^2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

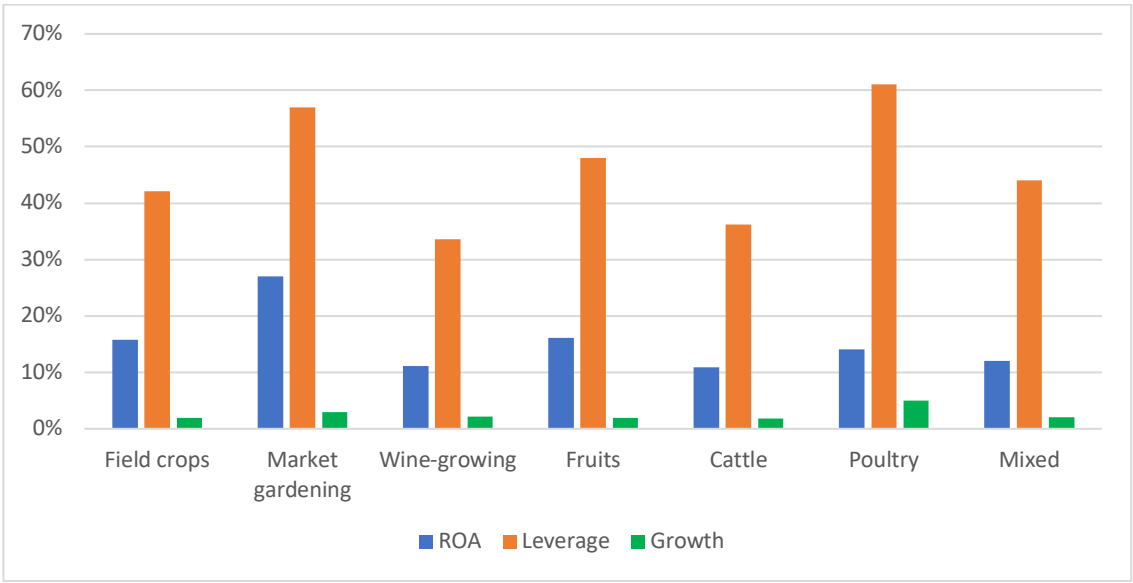
Key: The table presents the results of the different econometric models (panel data with random effects), one for each measure of earnings quality. *, ** and *** respectively denote significance at the 1%, 5% and 10% levels. All data come from the French Farm Accountancy Data Network (FADN). All variables are defined in Table 1 and winsorized at the 1% level to control for outliers.

Figure 1. Economic and financial dynamism of French farms



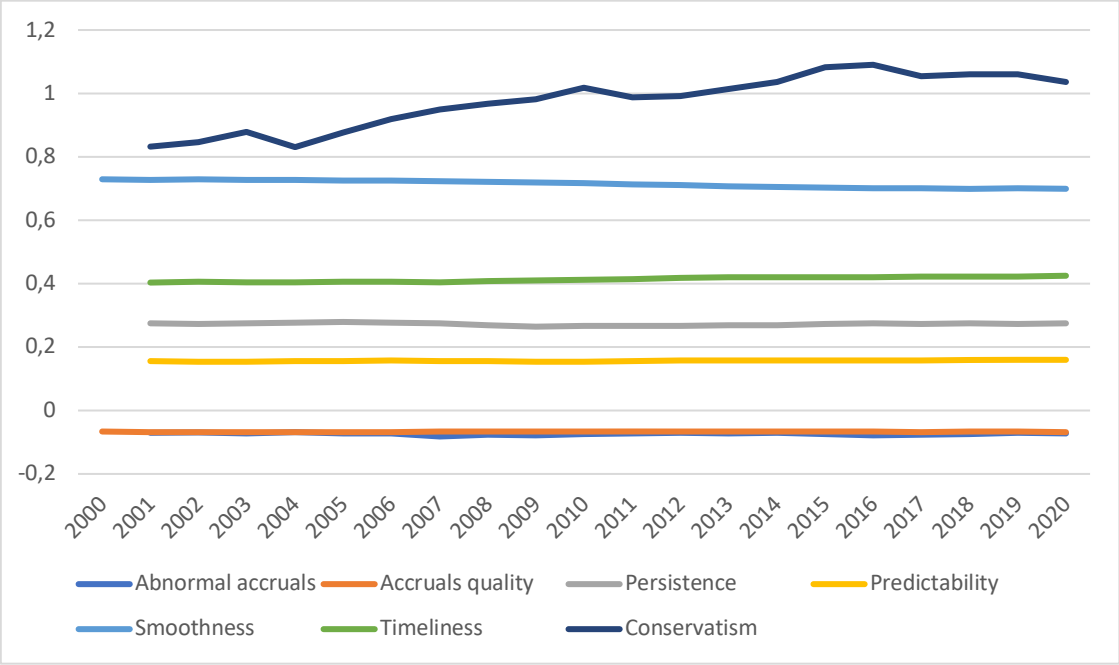
Source: Own computations based on the French Farm Accountancy Data Network (FADN) for years 2000-2020. All variables are defined in Table 1 and winsorized at the 1% level to control for outliers.

Figure 2. Economic and financial situation of French farms by specialization



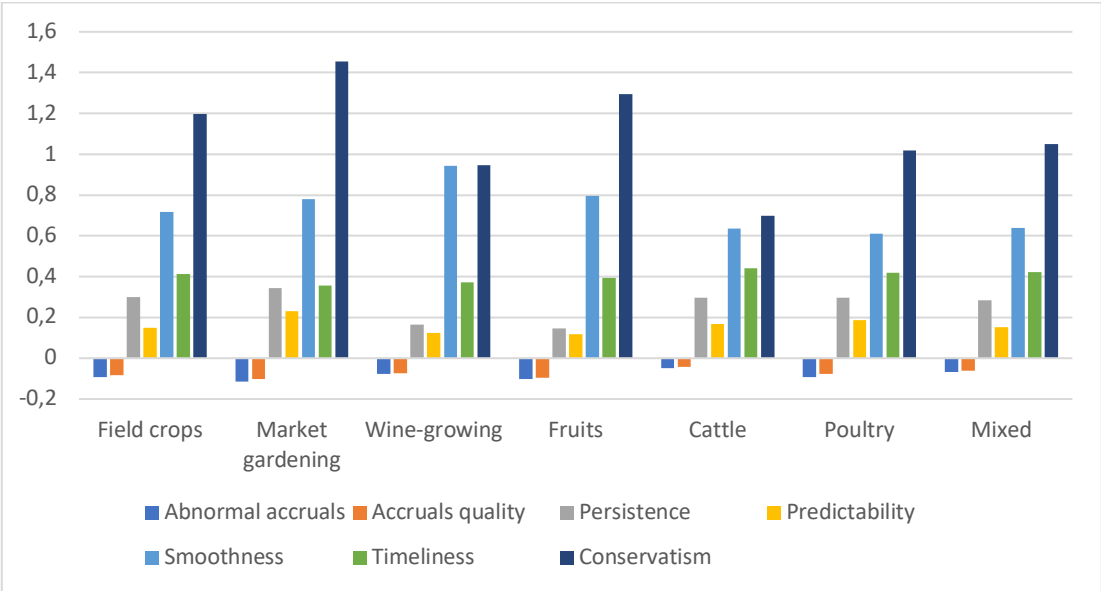
Source: Own computations based on the French Farm Accountancy Data Network (FADN) for years 2000-2020. All variables are defined in Table 1 and winsorized at the 1% level to control for outliers.

Figure 3. Evolution of earnings quality indicators of French farms



Source: Own computations based on the French Farm Accountancy Data Network (FADN) for years 2000-2020. All variables are defined in Table 2 and winsorized at the 1% level to control for outliers. For scale reasons, Smoothness2 is not displayed.

Figure 4. Earnings quality indicators of French farms by specialization



Source: Own computations based on the French Farm Accountancy Data Network (FADN) for years 2000-2020. All variables are defined in Table 2 and winsorized at the 1% level to control for outliers. For scale reasons, Smoothness2 is not displayed.

Figure 5. Results of the quantile regressions for earnings predictability