



Mic 2023

Management International Conference

Toward Green, Inclusive, and Digital Growth

Proceedings of the Joint International Conference Organised by

- University of Primorska, Faculty of Management, Slovenia
- University of Trieste, Department of Economics, Business, Mathematics and Statistics (DEAMS), Italy
- Juraj Dobrila University of Pula, Faculty of Economics and Tourism 'Dr Mijo Mirković,' Croatia

Trieste, Italy • 7–10 June 2023

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Foreword

Eight billion people have inhabited the Earth since November 2022. Earth's population is confronted with global warming, wars and conflicts are increasing globally, and poverty marks many parts of the world. It is a task and duty of the academic community to discuss the future developments at micro and macro levels. Scenarios for the future of humanity are not fixed and unavoidable. There are many ways to work towards a future that is green, digital, and inclusive. This 'trinity' of key concepts for humanity is not sufficient but obviously a required condition for future life.

Management International Conference (MIC) 2023 aimed at shedding light on a green, digital, and inclusive society. The researchers, professionals, and educators met in June 2023 in Trieste, Italy, to share with the MIC community ideas, research, and scenarios from different perspectives which contributed to challenging and interesting discussion. The conference hosted more than 130 participants and 99 papers were presented. We appreciate the contribution of all the participants and presenters.

Authors were invited to submit their full papers to the MIC 2023 Conference Proceedings; all the received papers have gone through a double-blind peer review process.

Several papers presented at the MIC 2023 conference were published in the MIC supporting journals:

- *Academica Turistica*
- *Economic Research/Ekonomska istraživanja*
- *E-mentor*
- *Human Systems Management*
- *International Journal of Sustainable Economy*
- *Management and Production Review*
- *Managing Global Transitions*
- *Public Sector Economics*
- *Review of Innovation and Competitiveness*

We sincerely thank all the editors for their cooperation.

Our deepest gratitude goes to Keynote Speaker, Dr Wayne Holmes (UCL Knowledge Lab at University College London, United Kingdom) and to all speakers at the Round Table 'Toward Green, Inclusive, and Digital Growth: Are Synergies Possible Among the Three?' We also thank the facilitators of the two workshops on methodology scheduled at the Pre-Conference Day, Dr Annamaria Tuan and Dr Bojan Nastav; facilitator of the '1X3' Research Hackathon and moderator of the Round Table, Dr Guido Bortoluzzi; editors participating in the Editors' Panel and all the organizers of special sessions.

Finally, our sincere thanks goes to everybody who participated in the scientific committee and organisation of the MIC 2023.

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Credit Scoring, Earnings Management, and Voluntary Adoption of IFRS

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Abstract. This study investigates the relationship between earnings management and credit scoring in private companies. Earnings management can be defined as the manipulation of financial statements by managers to meet or exceed analysts' expectations or to avoid reporting poor financial performance. On the other hand, credit scoring is a method credit rating agencies use to evaluate a company's creditworthiness. Unlike credit rating, credit scoring is an automated calculation of a company's creditworthiness that does not require the qualitative assessment of a rating analyst.

The accounting literature has developed several techniques to detect earnings management over the years, one of the components of the broader concept of earnings quality (Jones 1991, Dechow, Sloan, and Sweeney 1995, DeFond and Park 2001, Dechow, Ge, and Schrand 2010). IFRS are considered "investor-oriented" accounting standards, as opposed to most European national accounting standards, which can be defined as "creditor-oriented" (Nobes 1998). IFRS are generally considered high-quality standards that provide timely and relevant financial information. However, adopting IFRS *per se* does not necessarily lead to a decrease in earnings management and, thus, to an improvement in earnings quality. Findings so far have been contradictory (De George, Li, and Shivakumar 2016), and there is scarce literature focusing on private companies (Cameran and Campa 2020). Private companies, even though possibly benefiting from the lower scrutiny to which their financial statements are subject compared to listed companies, could still have incentives to manipulate their earnings, especially for better access to credit financing.

By studying about 10,300 Italian private companies from 2017 to 2021, of which more than 900 are voluntary adopters of IFRS, we find a negative relationship between earnings management and credit scoring, meaning that companies that engage in earnings management practices receive lower credit scores than their peers. However, the choice to adopt IFRS voluntarily seems connected to lower credit scores despite the higher earnings quality exhibited by IFRS adopters. Finally, we also find that companies engaging in earnings management are more likely to improve their credit scoring, suggesting that private companies may have incentives to manipulate their earnings to get better access to credit financing.

Keywords: credit scoring, earnings management, private companies, voluntary adoption of IFRS, accruals, financial reporting, financial information, earnings quality

1. Introduction

The EU IAS Regulation (Regulation No 1606/2002) mandates the use of IFRS (International Financial Reporting Standards) for the preparation of consolidated financial statements of companies whose securities are listed on a regulated market within the EU.

IFRS are developed and published by the International Accounting Standards Board (IASB), an independent international standard-setting body. The IASB aims to create a single set of high-quality, understandable, and enforceable global accounting standards.

The IAS Regulation provides an optional extension to allow member states to permit or require the use of IFRS for the individual financial statements of companies that are not required to prepare consolidated financial statements. This means that member states can choose to extend the use of IFRS beyond just the consolidated financial statements to include the standalone financial statements of unlisted companies, small and medium-sized enterprises (SMEs), and other entities. Member states may decide to adopt these optional extensions based on their own regulatory and economic considerations.

Mainly because of the close links between the individual financial statements of private companies and taxation (Lamb, Nobes, and Roberts 1998), several Member States decided against the voluntary application of IFRS to unlisted companies, or even the extension of IFRS to the individual statements of listed companies (Eberhartinger and Klostermann 2007). Others took a more liberal approach toward applying international accounting standards beyond the obligations set by the IAS Regulation¹. Italy belongs to a minority of EU countries that allow private companies to adopt IFRS voluntarily for preparing their individual financial statements, besides having pervasive financial information disclosure requirements, allowing for a good availability of financial data for this category of companies (Rizzo et al. 2020). Moreover, Italy has a “weak equity” accounting system, i.e., traditional European financial reporting standards, mainly creditor-oriented and focused on historical cost accounting. Conversely, IFRS are “strong equity” standards, geared towards investors and financial markets and focused on providing users timely and relevant financial information (Nobes 1998, Nobes and Parker 2020). Hence, their emphasis on fair value measurements and on the prevalence of substance over form when reporting business transactions.

Switching from national accounting standards to IFRS is a complex and expensive task that complicates tax reporting and dividend distribution when international standards are applied to individual financial statements. In weak equity contexts, it is also dubious whether international financial statement comparability in private companies is necessary. The main users of financial information, in fact, are banks and tax authorities, not equity investors. The most prevalent financing system for private companies can be described as an “insider” or “relationship-based” system, as opposed to an “outsider” system, given how capital is channelled to investment opportunities and how information asymmetries between contracting and financing parties are reduced (Leuz 2010). Few studies focus on why private companies adopt IFRS voluntarily (André, Walton, and Yang 2012). Prior literature has investigated their accounting choices, explaining how they are mostly related to country factors (Francis et al. 2008), company size, auditor reputation (André, Walton, and Yang 2012), opportunities for growth, and incorporation as a joint stock company (Bassemir 2018, Di Fabio 2018).

2. Earnings management and IFRS

Earnings management is a critical topic in accounting and finance literature, representing the manipulation of financial statements to achieve specific financial or reporting objectives. In the accounting literature, earnings management is a component of the broader concept of earnings quality. This expression may have several definitions, but it generally refers to the capability of accounting results to provide information about a firm’s financial performance that is relevant to decision-makers (Jones 1991, Dechow, Sloan, and Sweeney 1995, DeFond and Park 2001, Dechow, Ge, and Schrand 2010). Earnings quality is also investigated by measuring the timely recognition of losses and the value relevance of accounting information, both outside the scope of this research.

¹ See European Commission, “Overview of the use of options provided by the IAS Regulation (1606/2002) in the EU” as at 31 December 2022 (https://finance.ec.europa.eu/system/files/2023-03/311222-ias-regulation-use-of-options-overview_en.pdf).

According to Healy and Wahlen (1999), “Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting practices.” Earnings management can refer to the use of accounting practices that may alter the financial performance (i.e., accrual-based earnings management, through capitalization of costs, provisioning for risks, impairment of assets, etc.), without direct consequences on cash flows, and to the manipulation of real activities, aimed at improving reported performances (Roychowdhury 2006).

The main features of IFRS generally lead to the view that their adoption should increase earnings quality: their principle-based approach to financial reporting regulation may make it difficult to exploit loopholes; the prevalence of substance over form should ensure the faithful representation of business transactions; fair value measurements, as opposed to historical cost accounting, may lead to a more effective representation of the underlying economic events; finally, the reduced accounting options available to preparers of financial statement are also an indicator of high-quality accounting standards. In fact, prior research has identified several benefits deriving from the adoption of IFRS, among them a reduced cost of capital (Daske et al. 2008, Li 2010) and an increase in the information content of earnings announcements for companies that mandatorily adopted IFRS (Landsman, Maydew, and Thornock 2012).

Other studies, however, almost exclusively based on the mandatory adoption of IFRS, have provided mixed evidence (De George, Li, and Shivakumar 2016). Firstly, IFRS are not the only principle-based standards: local standards too may have the same characteristics, so switching from local accounting standards to IFRS does not necessarily imply a switch from detailed, ruled-based standards to more general, principle-based standards. Additionally, principle-based standards lack implementation guidance, which could lead to considerable managerial discretion in their application. Some studies even found evidence of a drop in earnings quality after the adoption of IFRS (Callao, Jarne, and Láinez 2007, Ahmed, Neel, and Wang 2013), while others found a decrease in accrual-based earnings management after mandatory IFRS adoption, but a contemporaneous increase in real earnings management (Ipino and Parbonetti 2017).

There is scant literature on earnings quality and the *voluntary* adoption of IFRS. Generally, research conducted on IFRS early adopters (i.e. before the standards became mandatory in the European Union) shows an improvement in earnings quality, because higher quality financial reporting may be an incentive connected to adopting the new standards (Cameran and Campa 2020). However, Cameran, Campa, and Pettinicchio (2014), studying a sample of Italian private companies voluntarily adopting IFRS in 2005-2008, found evidence of increased earnings management and a deterioration of timely loss recognition. Instead, a study conducted in a broader sample of EU companies by Cameran and Campa (2020) revealed a positive effect of IFRS adoption both on earnings quality and the cost of debt; moreover, private companies with higher earnings quality exhibited a decrease in cost of debt after the adoption of IFRS.

3. Credit scoring

Starting from the late 1960s, there has been considerable research into the use financial information to predict bankruptcy. Beaver (1966) examines 29 ratios in the five years preceding bankruptcy for a sample of firms, adopting a univariate approach, i.e., each ratio is considered alone in predicting bankruptcy. The cash flow/total liabilities ratio proved to be the best predictor. Later studies, however, employed a multivariate approach: Altman (1968) developed the Z-score, based on five ratios: working capital/total assets, retained earnings/total assets, operating income/total assets, market value of equity/book value of debt, and sales/total assets. Altman, Haldeman, and Narayanan (1977)

subsequently refined the model, including, among other improvements, several adjustments to the accounting information reported in the financial statements. A review of the relative merits of different statistical approaches to bankruptcy prediction can be found in Jones, Johnstone, and Wilson (2017).

Credit scoring is a bankruptcy prediction method that, unlike credit rating, is fully automated. In fact, the issuance of a credit rating involves the substantial intervention of human analysts, who combine qualitative assessments with the results of automated assessment models. In the European Union, credit ratings are regulated by Regulation (EU) 462/2013 and by Directive 2014/51/EU. In this paper, we employed the credit scoring provided by Modefinance, officially registered as a Credit Rating Agency by the European Securities and Market Authority (ESMA). Modefinance has developed a multidimensional and multiobjective algorithm called MORE (Multi Objective Rating Evaluation) that permits the assignment of credit scoring without performing a complete data analysis. The model assesses the risk of insolvency through the analysis and aggregation of indicators related to the “financial health” of the firm (profitability, liquidity, capital structure, and other variables), combined with country and industry variables.

The MORE model has several risk classes, presented in Table 1, indicating the company’s creditworthiness. Companies with a scoring of CC or lower are considered to be in technical default.

Table 1 – MORE credit score classes

Macro category	MORE Class	Assessment
Healthy companies	AAA	The company’s capacity to meet its financial commitments is extremely strong.
	AA	The company has very strong creditworthiness.
	A	The company has high solvency.
Balanced companies	BBB	Capital structure and economic equilibrium are considered adequate.
	BB	The company’s performances are adequate considering the sector and the country in which it is operating.
Vulnerable companies	B	The company presents vulnerable financial signals
	CCC	The company has a dangerous disequilibrium in its capital structure and its economic and financial fundamentals.
Risky companies	CC	The company shows signals of high vulnerability.
	C	The company shows considerable pathological situations.
	D	The company has no longer the capacity to meet its financial commitments.

Source: Modefinance documentation

Previous literature, focused on listed companies, has shown that firms tend to manage earnings to window-dress financial statements prior to securities offerings, to increase corporate managers’ compensation and job security, to avoid violating lending contracts, or to reduce regulatory costs or increase regulatory benefits (Kim, Kim, and Song 2013, Gounopoulos and Pham 2017). Some studies focus on earnings management and credit *ratings*, investigating either banks (Shen and Huang 2013) or listed companies (Mali and Lim 2016, Kim, Kim, and Song 2013). Results suggest that firms with higher credit ratings have lower levels of earnings management, and that companies engaging in earnings management pay the price in terms of a lower credit rating and, thus, a higher cost of debt (Shen and Huang 2013). To the extent of our knowledge, no studies investigate the relationship between automated credit scoring and earnings management in private firms.

4. Hypothesis development and research design

The accounting literature has developed several techniques to detect earnings management over the years, one of the components of the broader concept of earnings quality (Jones 1991, Dechow, Sloan, and Sweeney 1995, DeFond and Park 2001, Dechow, Ge, and Schrand 2010). The Jones (1991) model, later revised by Dechow et al. (1995), has seen wide application in previous studies, with several modifications and variants. The Jones-type models base their estimates of expected accruals on the coefficient from a regression that uses the change in sales (adjusted by the change in accounts receivable) and gross noncurrent tangible assets as independent variables to predict the discretionary accruals and include an intercept term equivalent to the average level of accruals (after controlling for the change in sales).

Given the limitations in data availability for private companies, and based on previous research in the field (Cameran, Campa, and Pettinicchio 2014, Cameran and Campa 2020) that considered the Jones-type models not fully suitable to private firms, we employed the DeFond and Park (2001) measure of earnings management, aimed at estimating abnormal (i.e., discretionary) working capital accruals.

$$[1] \quad AWCA_t = WC_t - \left(\frac{WC_{t-1}}{S_{t-1}} \right) \times S_t$$

Where:

AWCA: abnormal net working capital accruals at time t .

WC _{t} : Net working capital at time t .

WC _{$t-1$} : Net working capital at the end of the previous reporting period.

S _{t} : Sales at time t .

S _{$t-1$} : Sales at the end of the previous reporting period.

This metric aims to measure the difference between the observed level of working capital (defined as short-term operating assets minus short-term operating liabilities) and its expected level based on the previous period's sales and working capital. Conceptually, the measure captures the difference between realized working capital and a proxy for the market's expectations of the working capital required to support current sales levels. Intuitively, this difference represents working capital accruals that are unlikely to be sustained in the future and, therefore, are likely to reverse against earnings (DeFond and Park 2001). For example, a firm may engage in earnings management by overstating its allowance for bad debts, thus reducing current income and working capital levels. Eventually, thanks to the reversal property of accounting (Penman 2006), the allowance will be restored to its correct value because the receipts from debtors will be greater than the net amount of accounts receivable reported in the balance sheet. This reversal generates a gain that offsets the income-decreasing earnings management in which the firms had previously engaged. Therefore, abnormal or discretionary accruals should generally have no net impact on a firm's lifetime earnings (DeFond and Park 2001).

Generally, rating agencies are considered capable of "seeing-through" earnings manipulation techniques. Therefore, the scoring algorithm should penalize firms engaging in earnings management.

H0: Credit scoring is negatively associated with earnings management

Despite the assumption that earnings management leads to lower credit scoring when compared to companies less likely to manipulate their earnings, it is still reasonable to assume that private companies might engage in earnings management primarily to gain access to credit financing. Therefore, we decided to test the following hypothesis:

H1: Private firms engaging in earnings management are more likely to improve their credit scoring

While testing these hypotheses, we aim to isolate the effect of the choice of accounting standards to determine whether the behaviour exhibited by companies voluntarily adopting IFRS differs from that of the companies reporting under Italian national standards.

5. Sample description and result discussion

We employ a panel of 10,389 Italian private companies from 2017 to 2021, excluding subsidiaries of listed companies, companies with missing data, and companies with negative equity, for a total of 51,945 firm-year observations. Of these companies, 9,476 report under Italian national accounting standards, and 913 under IFRS. This sample covers almost the entirety of Italian private companies, and the adoption of a panel sample, as opposed to a cross-sectional sample, may allow us to observe better any manipulative behaviour exhibited by the same firms over a period of time.

All firms in our sample are either joint-stock companies («società per azioni») or limited companies («società a responsabilità limitata»). Banks and other financial firms are not included to ensure comparability within our sample. Table 2 reports the main characteristics of the firms analysed, which vary considerably in size, performance, financial structure, and credit scoring.

Table 2 – Descriptive statistics of the sample

Variable	Stds.	Min	Q1	Mean	Median	Q3	Max
Score	IFRS	1	5	6	6	7	10
	Local GAAP	1	6	7	7	8	10
Sales	IFRS	1	25,200	363,719	75,300	262,000	18,900,000
	Local GAAP	0.74	36,954	137,698	56,607	106,028	54,401,500
Total assets	IFRS	168	34,810	825,480	116,786	429,426	97,191,000
	Local GAAP	61	27,115	125,609	49,692	104,953	23,759,100
ROA	IFRS	-69.43%	0.88%	4.57%	3.72%	7.66%	71.84%
	Local GAAP	-127.46%	1.96%	6.30%	4.74%	9.13%	128.54%
Net working capital	IFRS	(1,766,000)	246	44,279	7,865	40,015	3,157,509
	Local GAAP	(2,961,863)	3,428	20,669	10,268	22,845	3,227,624
Debt %	IFRS	0.37%	49.34%	63.26%	66.33%	79.72%	99.93%
	Local GAAP	0.05%	48.60%	63.23%	66.18%	79.97%	99.99%
Intangibles %	IFRS	0.00%	0.39%	14.46%	4.35%	22.11%	95.30%
	Local GAAP	0.00%	0.18%	3.97%	0.94%	3.65%	90.31%

Note: data in thousands of €, excluding percentages and credit scoring.

Abnormal accruals (AWCA) are scaled by initial total assets, and they are winsorized at 95% to eliminate outliers, consistently with previous research (Cameran, Campa, and Pettinicchio 2014).

To test our first hypothesis, we developed a linear regression where credit scoring is the dependent variable. In contrast, the independent variables are abnormal accruals, choice of accounting standards, and other control variables related to credit scoring (foreign ownership, profitability, financial structure, capital intensity). Our model is as follows:

$$[2] \text{SCORE}_{it} = \beta_0 + \beta_1 \text{AWCA}_{it} + \beta_2 \text{IFRS}_{it} + \beta_3 \text{FOREIGN}_{it} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{TANG}_{it} + \beta_6 \text{DEBT}_{it} + \beta_7 \text{ROA}_{it} + \beta_8 \text{YEAR}_{it} + \varepsilon_{it}$$

Where:

SCORE_{it} : Credit scoring for firm i in year t , converted to a numerical scale, where 1 is the lowest score (D) and 10 the highest (AAA).

AWCA_{it} : Absolute value of abnormal working capital accruals for firm i in year t , calculated as described in equation [1] and scaled by total assets at the end of the previous period.

IFRS_{it} : dummy variable related to accounting choice (1 for IFRS, 0 for national accounting standards).

FOREIGN_{it} : dummy variable indicating the presence of a foreign parent company or ultimate owner.

SIZE_{it} : the natural logarithm of the firm's total assets at time t .

TANG_{it} : the percentage of tangible fixed assets over total assets.

INTANG_{it} : the percentage of intangible assets over total assets.

DEBT_{it} : the ratio between total liabilities and total assets, a measure of financial structure.

ROA_{it} : the ratio between operating result and total assets, a measure of financial performance.

YEAR_j : year dummy variables.

Since we do not have a specific expectation on the direction of the earnings manipulation, we used the absolute values of abnormal accruals in our analysis, consistent with previous research (Callao, Jarne, and Láinez 2007, Cameran, Campa, and Pettinicchio 2014, Cameran and Campa 2020).

We correlate the credit scoring of a specific reporting period with the independent variables measured at the same time, instead of comparing the scoring of one period with the independent variables measured in the previous period, as in Mali and Lim (2016). The reason we have decided against introducing a time lag in our model is that credit scoring, being fully automated, can be determined as soon as the information becomes available, while credit rating, to which the models employed in previous research refer, requires human intervention and, therefore, more time to be issued or reviewed. Table 3 reports the Pearson correlation matrix among the independent variables. It can be noted that the sample does not present particular issues of multicollinearity despite the presence of mostly accounting variables. The highest correlations, yet still at acceptable levels, can be observed between the IFRS dummy variable and investment in intangible assets (0.29) and between firm size and investment in tangible (0.23) and intangible assets (0.22). We also calculated the variance inflation factor (VIF) for all the variables, and the highest score is 1.19 (financial leverage), confirming that the model does not exhibit worrying signs of multicollinearity.

Table 3 – Pearson correlation matrix

	IFRS	Foreign	SIZE	ROA	DEBT	AWCA	INTANG	TANG
IFRS	1							
Foreign	0.11***	1						
SIZE	0.19***	0.07***	1					
ROA	-0.06***	0.04***	-0.12***	1				
DEBT	0	-0.06***	-0.18***	-0.31***	1			
AWCA	-0.01	0.01**	-0.07***	0.01***	0.1***	1		
INTANG	0.29***	0.09***	0.22***	-0.08***	-0.04***	-0.03***	1	
TANG	0.08***	-0.09***	0.23***	-0.14***	-0.13***	-0.1***	-0.11***	1

Note: *** significant at the 0.01% level.

Table 4 reports the results of the linear regression in [2].

Table 4: Results of the linear regression in [2]

Variable	Coefficient	Std. Error	t value	p-value	Significance
(Intercept)	9.219682	0.036338	253.718	0.000	***
AWCA	-0.071934	0.010646	-6.757	0.000	***
IFRS	-0.204832	0.012081	-16.955	0.000	***
FOREIGN	0.148347	0.007778	19.073	0.000	***
SIZE	-0.071471	0.002866	-24.936	0.000	***
TANG	-0.794404	0.018116	-43.851	0.000	***
INTANG	-0.548299	0.033461	-16.386	0.000	***
DEBT	-3.864147	0.016653	-232.035	0.000	***
ROA	9.205565	0.042076	218.785	0.000	***
YEAR.2	0.013823	0.010215	1.353	0.176	
YEAR.3	0.003795	0.010224	0.371	0.71	
YEAR.4	-0.073511	0.010281	-7.15	0.000	***
YEAR.5	0.050025	0.010267	4.873	0.000	***
Adjusted R-squared	0.756				
F-Statistic (sig)	0.000				

Notes: *** significance at the 0.01% level. YEAR.2 is 2018, YEAR.3 is 2019, YEAR.4 is 2020, and YEAR.5 is 2021. The base year is 2017

Except for two of the year dummy variables, all the independent variables in our model are statistically significant. More importantly, the abnormal working capital accruals are negatively correlated with credit scoring, meaning that companies engaging in earnings management activities indeed tend to be penalized, thus confirming our first hypothesis H0. Credit scoring is also negatively associated with the voluntary adoption of IFRS, a rather counterintuitive result, already discussed in Bertoni, Valentinuz, and Pediroda (2022). The fact that lower credit scores characterize IFRS adopters is in apparent contrast with the notion that IFRS standards produce high-quality financial statements, with lower latitude for earnings management. This paradox can be explained by attributing the lower credit score not to the features of IFRS financial statements *per se*, but to the distinctive characteristics of voluntary IFRS adopters in terms of industry, capital structure, and composition of the assets, that would require further investigation. These characteristics are likely to be more relevant than earnings management in explaining the association between credit scoring and the voluntary adoption of IFRS.

Credit scoring is also negatively associated with company size, financial leverage, and capital intensity, while it is positively associated with financial performance and foreign ownership.

We investigate H1 by designing a dummy variable that measures whether there has been an improvement in credit rating from one year to the other. In fact, even if abnormal accruals are associated with lower credit scoring, this result does not exclude that firms could still engage in earnings management to improve their relative scoring. We perform a logit regression using the following model [3]:

$$[3] \text{Prob}_{it} (\text{SCORE_IMPROVEMENT}=1) = \beta_0 + \beta_1 \text{AWCA}_{it} + \beta_2 \text{FOREIGN}_{it} + \beta_3 \text{SIZE}_{it} + \beta_4 \text{TANG}_{it} + \beta_5 \text{INTANG}_{it} + \beta_6 \text{DEBT}_{it} + \beta_7 \text{ROA}_{it} + \beta_9 \text{YEAR}_i$$

Where SCORE_IMPROVEMENT is a dummy variable (1 for an upgrade in credit scoring from one year to the other, 0 otherwise). The independent variables remain the same as in model [2].

Table 5 reports the result of the logit binary regression:

Table 5: Results of the logistic binary regression in [3]

Variable	Coefficient	Std. Error	z-value	p-value	Significance
(Intercept)	-1.43599	0.12036	-11.931	0.000	***
AWCA	0.238055	0.030659	7.765	0.000	***
IFRS	0.037704	0.03846	0.98	0.32691	
FOREIGN	0.120247	0.024938	4.822	0.000	***
SIZE	-0.03344	0.009379	-3.566	0.00036	***
TANG	4.99452	0.11636	42.925	0.000	***
INTANG	0.18125	0.08131	2.229	0.026	**
DEBT	0.324624	0.055326	5.868	0.000	***
ROA	4.390552	0.14164	30.998	0.000	***
YEAR.2	-0.13557	0.034201	-3.964	0.000	***
YEAR.3	-0.16569	0.034494	-4.803	0.000	***
YEAR.4	0.056579	0.033844	1.672	0.09457	*
YEAR.5	0.565441	0.031933	17.707	0.000	***
% correctly predicted	84.44%				
Model Chi-square	3869.033				
Model Chi-square sig.	0.000				

Notes: *** significance at the 0.01% level. ** significance at the 1% level. * significance at the 5% level. YEAR.2 is 2018, YEAR.3 is 2019, YEAR.4 is 2020, and YEAR.5 is 2021. The base year is 2017

The results show that companies that engage in earnings management have a greater probability of improving their credit scoring, compared to companies with higher earnings quality. The IFRS variable is not significant, meaning that the choice of accounting standards adopted does not seem to influence the probability of improving the company's scoring. The other variables are all statistically significant. H1 is therefore confirmed, showing that, despite being characterized by a lower credit scoring, companies with greater levels of earnings management are still likely to benefit from the manipulation of earnings.

Even if our model does not detect any connections between improvements in credit scoring and accounting standards adopted, abnormal working capital accruals (AWCA) in our sample differ for IFRS and local standards companies. Table 6 summarizes the main descriptive statistics for this variable, once scaled by beginning total assets.

Table 6: Abnormal working capital accruals (AWCA) scaled by beginning total assets

Variable	Stds.	Min	Q1	Mean	Median	Q3	Max	Std dev.
AWCA	IFRS	0.0000	0.0113	0.2377	0.0295	0.0719	607.3960	9.065039
	Local GAAP	0.0000	0.0174	0.1075	0.0421	0.0899	319.2990	1.6956

It can be observed that IFRS companies in our sample are characterized by higher average abnormal working capital accruals, when compared to companies adopting local standards, while the situation is

reversed for the median. To test the differences between the two samples, once we verified via a Shapiro-Wilk normality test that the abnormal accruals are not distributed normally, we employed a Wilcoxon non-parametric test to verify the descriptive analysis reported in Table 6. The results confirm that IFRS companies do indeed exhibit lower median abnormal working capital accruals than local GAAP companies ($W = 93301576$, $p\text{-value} < 0.001$). This is consistent with the concept that IFRS are high-quality accounting standards that reduce the latitude for earnings management (Cameran and Campa 2020). This result, however, does not translate into an improvement in creditworthiness.

6. Conclusions

Our results suggest that there is a negative association between credit scoring and earnings management, meaning that private companies engaging in earnings management tend to receive lower credit scores. To the extent of our knowledge, it is the first time that this association has been studied in private firms. Our findings also confirm that private companies voluntarily adopting IFRS exhibit better earnings quality than companies reporting under national accounting standards. However, IFRS adoption is also negatively associated with credit scoring, suggesting that other characteristics of voluntary IFRS adopters may play a more significant role than earnings management. Additionally, the study finds that companies with higher levels of earnings management are more likely to improve their credit scoring, despite having lower credit scores when compared to their more virtuous peers. This means that earnings management can at least temporarily benefit private firms willing to get easier access to debt financing, thus providing an incentive to engage in such earning manipulation activities.

More research is needed to test whether there are industry-specific factors that can help explain our results. The limited availability of data on private companies prevented us from testing our hypotheses on a wider sample of companies, including countries other than Italy. Further research is required to determine whether our results can be extended to private companies in the rest of the European Union and elsewhere. Moreover, investigating other aspects of earnings quality, such as real earnings management and the timely recognition of losses, could shed more light on the connection between creditworthiness and the manipulation of earnings in private companies.

We contribute to the scant literature on earnings management in private companies, offering a new perspective based on the link between earnings management and credit scoring. We believe our findings can be relevant to investors and lenders who rely on credit scorings to make critical financial decisions, besides adding to the broader debate about accounting harmonization in the EU.

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