



# Re-Inventing or Re-Vitalising?

# Challenges for Post- Pandemic Era

Proceedings of the Joint International Conference Organised by

- University of Primorska, Faculty of Management, Slovenia
- Juraj Dobrila University of Pula, Faculty of Economics and Tourism 'Dr Mijo Mirković,' Croatia

Ljubljana, Slovenia • 9–11 June 2022

## **MIC 2022: Re-Inventing or Re-Vitalising? Challenges for Post-Pandemic Era**

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## Foreword

What will the world look like in the next 10 years after Covid-19? Some authors say there will be a 'new old' reality while some argue that Covid-19 marked the beginning of a new era in economic, social, societal, technological, and ecological fields. Heraclitus, a Greek philosopher said that we never step into the same river twice, so one assumption is that after Covid-19 changes are inevitable and irreversible. The challenge is whether we have learned lessons from the Covid-19 period and how we can re-vitalise in a new way and/or re-invent a new reality.

The above question was at the forefront of the 21st edition of the Management International Conference (MIC) that was held in June 2022 in Ljubljana, Slovenia. The conference hosted around 100 participants, who presented 61 research papers. We express our sincere appreciation to all the participants and presenters for their contributions and participation.

After the conference authors were invited to submit their full papers to the MIC 2022 Conference Proceedings. All the received papers have gone through a double-blind peer review process.

Several papers presented at the MIC 2022 conference were published in the MIC supporting journals:

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

We sincerely thank all the editors for their cooperation.

Our deepest gratitude goes to Keynote Speakers, Dr Alec Wersun (Glasgow School for Business and Society, Glasgow Caledonian University, Scotland, UK, and PRME Global Chapter Council) and Dr Iva Tomić (Croatian Employers' Association, Croatia).

The MIC 2022 conference hosted also the multiplier events of two Erasmus+ projects, I-THEN and INSHIP, Innovative Pedagogical Approach in Practice workshop, Spatial Transformation in Agriculture - A Hungarian-Slovenian Comparison workshop and two workshops for the PhD students and young researchers (Everything is Not on the Likert Scale - How to Ask the Right Question?, and How to Publish in Economic and Business Journals?). We thank all the workshops organizers for their contribution.

Finally, we extend our sincere thanks to everybody who participated in the programme boards and organisation of the MIC 2022.

Dr Anita Trnavčević  
Conference Chair

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## **Does Voluntary Adoption of IFRS by Private Companies Enhance Their Credit Scoring? An Empirical Analysis**

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*Abstract.* International Financial Reporting Standards (IFRS), used by more than 27,000 listed companies in about 100 countries around the world, are considered “investor-oriented” accounting standards. Instead, most national accounting standards in Europe could be defined as “creditor-oriented” standards, primarily focused on the financial information needs of creditors and, to a certain extent, tax authorities. In this sense, national accounting standards can be seen as typical of “weak equity” accounting systems, while IFRS exhibit all the characteristics of “strong equity” accounting systems. Even if EU Regulation No. 1606/2002 allows Member States to extend the use of IFRS beyond the scope of the Regulation itself, in most EU countries the close link between financial reporting and taxation has often represented an obstacle to full IFRS adoption by private companies, or even for the preparation of the individual financial statements of listed companies.

Previous studies have investigated the accounting choices of private companies, explaining how they are mostly related to company size, auditor reputation, opportunities for growth, and the presence of a parent company reporting under IFRS. One of the factors often cited in several studies is the correlation between financial leverage and voluntary adoption of IFRS.

Our aim is to determine whether the choice of adopting IFRS has an impact on private companies’ credit scoring. We compare a sample of about 1,000 Italian private companies that adopted IFRS voluntarily, representing almost the entirety of voluntary adopters in Italy, with a control sample of non-adopters to correlate their credit scoring, provided by a rating agency, with their choice to adopt IFRS and with other financial and governance variables. We believe that our research investigates the voluntary adoption of IFRS by private companies from a new perspective, allowing us to shed some light on the connections between financial reporting practices in creditor-oriented financial systems and access to credit financing.

*Keywords:* IFRS voluntary adoption, credit scoring, private companies, financial reporting

### **1. Introduction: International Financial Reporting Standards in the European Union.**

International Financial Reporting Standards (IFRS), used by more than 27,000 listed companies in about 100 countries around the world (IFRS Foundation 2018), are considered “investor-oriented” accounting standards. IFRS possess all the characteristics of a “strong equity” accounting system, including pervasive fair value measurements, and prevalence of substance over form when reporting business transactions. In general, the IFRS’s main goal can be identified as the reduction of information asymmetries between preparers and users of financial statements (mainly outside equity investors), enhancing the capital markets’ efficiency. Another trait commonly associated with IFRS is a reduced

role played by conservatism in financial reporting, which is not included among the qualitative characteristics of accounting information according to the IASB's Framework because it introduces a bias in favour of specific categories of users of financial information, i.e. creditors (IASB 2018). Conservatism, which determines an asymmetric recognition of gains and losses, is instead considered one of the main features of "weak equity" accounting systems and has special prominence in the European Union accounting regulations. Most national accounting standards in Europe could be defined as "creditor-oriented", since they are primarily focused on the financial information needs of creditors and, to a certain extent, tax authorities (Nobes 1998, Nobes and Parker 2020). Other characteristics of weak equity accounting systems are, besides the relevance of conservatism, a strong reliance on historical cost for the measurement of most or all assets and liabilities, fixed layouts for drawing up financial statements, and a lowered attention to the substance of the transactions, as opposed to their form (e.g. leasing contracts).

Since 2005, IFRS have become mandatory in the European Union for the consolidated financial statements of listed companies, thus creating different financial reporting requirements for listed and unlisted companies, configuring a situation of differential reporting (Evans et al. 2005, Eierle 2005).

EU Regulation No. 1606/2002 allows Member States to extend the use of IFRS beyond the consolidated statements of listed companies, i.e. to the individual statements of listed companies, and the individual and consolidated statements of unlisted companies and groups. EU countries have had a diversified approach to the options offered by the Regulation, ranging from a rather strict approach to IFRS adoption (France, Spain, Germany, Sweden...) to a more liberal attitude towards the application of international accounting standards (Italy, the Netherlands, Slovenia, Czech Republic, Croatia, Lithuania...)<sup>1</sup>.

In general, there is an important difference between adopting IFRS for the consolidated financial statements, which do not have a strict connection with taxation and dividend distribution, and using them to draw up individual financial statements, for which this connection is much stronger. In most EU countries this close link between financial reporting and taxation (Lamb, Nobes, and Roberts 1998) has often represented an obstacle to full IFRS adoption by private companies, or even for the preparation of the individual financial statements of listed companies (Eberhartinger and Klostermann 2007).

In this perspective, Italy is an exception, being a country with a strict connection between tax and financial reporting and yet allowing private companies to adopt IFRS voluntarily, including when preparing their individual financial statements, in contrast to the choices made by most EU countries with traditional "weak equity" accounting systems. In addition, Italy has among the most pervasive financial information disclosure requirements for private companies in the EU, allowing for a good availability of financial data for this category of companies (Rizzo et al. 2020). For these reasons, we decided to focus our analysis on the voluntary choices made by Italian private companies.

## 2. Credit scoring and MORE

The evaluation of a company's default risk is relevant for the trustability of the financial system and the appropriate process of resource allocation to companies. Even if the modern era of commercial default prediction began with the work of Beaver (1966) and Altman (1968) in the late 1960s, bankruptcy predictions have been extended to a large scale only thanks to the development of new technologies and the introduction of powerful computers. The use in the economic field of algorithms such as support vector machines (SVM), decision trees, neural networks, and genetic optimization algorithms (GA) permitted the inclusion of many variables in the analysis and processing of a massive amount of data.

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<sup>1</sup> See European Commission, "Overview of the use of options provided by the IAS Regulation (1606/2002) in the EU as at Dember 2018" ([https://ec.europa.eu/info/sites/default/files/business\\_economy\\_euro/company\\_reporting\\_and\\_auditing/documents/ias-regulation-use-of-options-overview\\_en.pdf](https://ec.europa.eu/info/sites/default/files/business_economy_euro/company_reporting_and_auditing/documents/ias-regulation-use-of-options-overview_en.pdf)). In January 2020 the UK ceased to be a member of the European Union. It is worth mentioning, however, that non-public interest companies in the UK can choose between UK GAAP and IFRS for both their individual and consolidated accounts. Listed companies domiciled in the UK must adopt UK-endorsed IFRS for their consolidated financial statements, but can choose between IFRS and UK GAAP for their individual accounts. See: IFRS Foundation (2022). IFRS application around the world. Jurisdictional profile: United Kingdom.



In this paper, we employed the scoring calculated by modefinance, a spin-off company of the University of Trieste and officially registered as a Credit Rating Agency by European Securities and Market Authority (ESMA). modefinance is a fintech company that uses the most modern artificial intelligence technologies and data mining to assess the credit risk of millions of companies in many parts of the world. Thanks to technology, modefinance can determine - using the information in companies' financial statements - the credit risk of large and small companies and compare it with companies operating in the same sector and based in the same country.

It is necessary to clarify now the difference between credit scoring and rating. The credit score is obtained through the use of an automated (statistical) method of calculation. On the other hand, a rating involves the substantial intervention of rating analysts who combine qualitative assessments with the results of automated assessment models. In the European Union, only the creditworthiness assessments issued in compliance with Regulation (EU) number 462/2013 of the European Parliament and of the Council of 21 May 2013 and the Directive 2014/51/EU of the European Parliament and of the Council of 16 April 2014, can be defined as ratings.

The bankruptcy prediction methods based on statistical theory or machine learning normally require an accurate and complete database of financial information, including that of companies that have declared bankruptcy. Given the difficulty in assembling such a database, modefinance has developed a multidimensional and multiobjective algorithm – called MORE – which is based on an accurate, automatic methodology dependent upon combining different numerical models. MORE (Multi Objective Rating Evaluation) produces a classification of each company by considering any attributes (such as sector and country) characterizing a firm. The model allows to assign a scoring to a company without performing a complete data analysis, filtering the qualitatively more remarkable information. The model induces a better understanding of a company's strengths and weaknesses thanks to an automated integration between sophisticated data mining tools and the analysts' knowledge.

The risk of insolvency is assessed through the analysis and aggregation of indicators relating to the most relevant dimensions for the analysis of the health status of a company: profitability, liquidity, capital structure, interest coverage, and efficiency. In order to contextualize the analysis of the company concerning the reference environment (particularly relevant aspect for companies that are less diversified by business lines and regarding the end markets), the MORE model focuses its attention on the following elements: 1) the country of reference, 2) the sector to which it belongs, and 3) the financial variables available. MORE's philosophy is based on the principle that the better the balance between the different areas, the lower the total financial risk of the company examined.

In reality, the MORE model comprises thousands of models (about twenty thousand), and each model is used to interpret and understand – through fuzzy logic – the “goodness” of the company to the value of each indicator considered. Fuzzy logic is a mathematical model, concretely developed by Zadeh (1965), used to translate verbal sentences and qualitative information into quantitative terms, permitting a “degree of membership” with a continuous number from 0 to 1. An interesting literature review of methods that use fuzzy logic and genetic algorithms, alone or combined with other methods for bankruptcy prediction, can be found in Chou, Hsieh, and Qiu (2017).

For each indicator, a value is identified that characterizes the ideal situation and another value that represents the worst situation: the coefficient obtained for each company is relativized concerning these two extremes, which can assume different values about the country or sector in which the firm operates. The model is taking into account only the ratios and indicators which are predictive of the default events considering independently the different sectors and countries. This way of proceeding can lead to evaluating with a different rating two companies with the same economic and financial indicators (e.g., same ROE, the same coverage ratio of financial charges...) that operate in different countries or sectors. Through a decision support algorithm, the MORE model synthesizes the different “opinions” – transformed from qualitative to quantitative expressions – on the ratios used in the analysis to assign a final rating. Alongside the risk class, the MORE model provides a) the probability of default, b) the level of confidence, c) the opinion on the values of the ratios, d) the comparison with the reference group, and e) the MORE credit limit.

If the risk class indicates a company's creditworthiness, the probability of default represents the probability (in quantitative terms) that the company enters a so-called technical default (status of a company with a CC rating or lower). The confidence level expresses the level of economic and financial detail that the MORE model is able to analyse for each company (a level of 100 means complete availability of data, while a value of 0 indicates the absence of any economic and financial information). Twice a year, starting from all the scoring produced for each sector and each country, modefinance calculates the average of the ratings and the probability of failure; this allows to obtain helpful information from the comparison between the analysed company and the reference peer group (companies in the same sector). The MORE credit limit is an estimate of the maximum amount that can be granted in the form of credit, in a commercial relationship and over one year, to the companies being analysed.

The MORE model has several risk classes, presented in Table 1, which we adopted in our analysis.

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

It is important to observe that, even though the MORE model aims to anticipate the default event by analyzing the financial fundamentals of the firm, it does not consider the accounting standards as an independent variable. Therefore, the adoption of IFRS in itself does not lead to any penalization, or favour, in the assignment of a credit score.

### 3. Determinants of voluntary adoption of IFRS by private companies

Switching from national accounting standards to IFRS, a complex and expensive task in itself, increases the complexity of tax reporting and dividend distribution, especially when local accounting standards differ greatly from IFRS<sup>2</sup>. Moreover, it is debatable whether private companies need international comparability for their financial reports, especially in weak equity contexts, where the main users of financial information are not the financial markets, but banks and national tax authorities. The prevalence of the latter users can lead to identifying an “insider”, or “relationship-based” financial system, as opposed to an “outsider” system, depending on how capital is channelled to investment

<sup>2</sup> It is the case of Italian national standards. Besides widening the divergence between taxable income and financial reporting, Italian law imposes limits to the distribution of dividends to companies using IFRS in their individual accounts, to prevent the distribution of unrealized profits (Legislative Decree 38/2005).

opportunities and how information asymmetries between contracting and financing parties are reduced (Leuz 2010). Insider users of financial information generally do not rely just on public financial statements to support their decision-making process, since they can access private information to satisfy their needs. Therefore, while there is a vast literature on voluntary adoption of IFRS by listed companies, mainly predating the mandatory adoption of international accounting standards that has begun spreading around the world since 2005, relatively few studies focus on the reasons why private companies decide to adopt IFRS voluntarily (André, Walton, and Yang 2012).

For listed companies, international cross-listings have often been identified as one of the most relevant factors in adopting IFRS (El-Gazzar, Finn, and Jacob 1999, Murphy 1999, Ashbaugh 2001, Cuijpers and Buijink 2005). Exposure to international markets has also been shown to influence voluntary IFRS adoption by listed companies, mainly because of the benefits deriving from the increased financial statements comparability (Dumontier and Raffournier 1998, Murphy 1999).

For private companies, previous studies have 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). The degree of separation between ownership and control often cited as one of the main features of modern capitalism (Berle and Means 1932), seems to have a role in the voluntary adoption of IFRS by private companies, because of the reduced opportunities for earnings management and the enhanced transparency offered by IFRS may reduce the conflicts of interests between management and shareholders (Jensen and Meckling 1976). Some previous studies conducted in the Italian context support this hypothesis (Matonti and Iuliano 2012, Pichler, Cordazzo, and Rossi 2018).

Generally, private companies that belong to listed groups may find it useful to adopt IFRS, whenever this option is offered by the rules of the jurisdiction to which they are subject, to ease the consolidation process by removing the necessity of reconciling local financial statements to IFRS. In fact, the presence of a parent company reporting under IFRS has been identified by previous studies as one of the determinants of voluntary IFRS adoption (Matonti and Iuliano 2012, Pettinicchio, Campa, and Cameran 2013). Similarly, the presence of foreign investors in the equity of the company has been identified by a limited set of studies as one of the variables that can influence voluntary IFRS adoption (Di Fabio 2018, Matonti and Iuliano 2012).

Given the considerable financial resources needed to switch from national standards to IFRS, size has often been proved to be correlated with the voluntary adoption of IFRS by several studies (Pettinicchio, Campa, and Cameran 2013, Matonti and Iuliano 2012, André, Walton, and Yang 2012, Bassemir 2018, Di Fabio 2018, Pichler, Cordazzo, and Rossi 2018).

When identifying the financial variables that might affect the choice to adopt IFRS, profitability is sometimes theorized to be relevant, since more profitable companies arguably have fewer incentives to engage in earnings management practices, which are made more difficult by the transparency and comparability imposed by IFRS (Dumontier and Raffournier 1998). Empirical studies conducted on private companies, however, have failed to provide clear evidence of the role played by profitability in explaining the voluntary adoption of IFRS.

Another factor often cited in several studies is the positive correlation between financial leverage and voluntary adoption of IFRS (André, Walton, and Yang 2012, Pettinicchio, Campa, and Cameran 2013, Di Fabio 2018, Pichler, Cordazzo, and Rossi 2018). Indeed, the timely and relevant financial information provided by IFRS could grant voluntary adopters easier access to credit financing, and reduce the cost of debt, an incentive that should exercise more influence on companies with a high debt-to-equity ratio. On the other hand, lower financial leverage could signal a more open capital structure, with a possible widening of the separation between ownership and control, and a consequent need for more transparent and up-to-date financial information. However, several studies fail to identify a significant connection between financial leverage and IFRS adoption (El-Gazzar, Finn, and Jacob 1999, Pichler, Cordazzo, and Rossi 2018, Matonti and Iuliano 2012, Dumontier and Raffournier 1998), while Bassemir (2018) and

Di Fabio (2018) find a positive correlation, supporting the view that voluntary IFRS adopters are characterised by stronger financing needs.

Capital intensity, often measured as the percentage of noncurrent assets over total investments, has sometimes been identified as a variable capable of explaining the voluntary adoption of international accounting standards. Some authors hypothesize a negative correlation between capital intensity and voluntary adoption of IFRS, claiming that a higher percentage of noncurrent assets determines lower monitoring costs, and thus a lower probability of adopting IFRS (Dumontier and Raffournier 1998, André, Walton, and Yang 2012, Di Fabio 2018). Others claim that higher capital intensity is correlated with higher entry barriers, and therefore with an increased propensity to provide transparent and up-to-date financial information by adopting IFRS (Orens, Renders, and Crabbé 2010). In conclusion, the effect of capital intensity on the voluntary adoption of IFRS is still debated.

Finally, to the extent of our knowledge, no previous studies have investigated the relationship between credit scoring and voluntary adoption of IFRS by private companies.

#### 4. Hypothesis development and research design

Our study aims to determine whether the choice of adopting IFRS has an impact on private companies' credit scoring. Given that private companies mainly finance their operations through credit financing, we suppose that the choice to adopt IFRS in a weak equity context should be positively correlated with the companies' credit scoring, compared to non-adopters.

**H0** Private companies that voluntarily apply IFRS have better credit scoring than companies reporting under Italian accounting standards.

In order to test our hypothesis, we develop a linear regression model where credit scoring is the dependent variable, and voluntary IFRS adoption is the independent variable, along with control variables for size, foreign ownership, capital intensity, financial leverage, profitability, and year dummy variables:

$$[1] \text{ SCORE}_{it} = \beta_0 + \beta_1 \text{ IFRS}_{it} + \beta_2 \text{ FOREIGN}_{it} + \beta_3 \text{ SIZE}_{it} + \beta_4 \text{ TANG}_{it} + \beta_5 \text{ INTANG}_{it} + \beta_6 \text{ DEBT}_{it} + \beta_7 \text{ ROA}_{it} + \beta_8 \text{ YEAR}_i + \varepsilon_{it}$$

Where SCORE is the MORE credit rating score for company  $i$  in year  $t$ , converted to a numerical scale from 1 (score D) to 10 (score AAA). IFRS is a dummy variable related to the accounting standards adopted by company  $i$  in year  $t$  (0 for Italian Generally Accepted Accounting Standards or GAAP, 1 for IFRS). FOREIGN is a dummy variable to keep track of whether the company's ultimate owner is a foreign company. SIZE is the natural logarithm of the company's total assets, used as a proxy for its size. TANG is the percentage of tangible fixed assets over total assets, and INTANG is the percentage of intangible assets. We aim at measuring capital intensity by separating tangible and intangible assets, because of the stricter requirements, compared to Italian accounting standards, posed by IFRS for the recognition of intangible assets. DEBT is a measure of financial leverage, the percentage of liabilities over total assets. ROA is a measure of profitability, calculated as the operating profit over total assets. YEAR is a dummy variable to control year-effect in our sample, which spans from 2015 to 2019.

In addition, we aim to investigate the firm-level determinants that can explain the adoption of IFRS by private companies. Building on previous literature summarised in the previous paragraphs, we develop additional hypotheses. Firstly, we assume that the size of the company has an influence on the probability of adopting IFRS, for the reasons explained above:

**H1** Larger private companies are more likely to adopt IFRS.

Then we assume that private companies whose ultimate owner is a foreign corporation or entity are more likely to adopt IFRS, because they have a greater incentive to adopt international accounting standards, to enhance the comparability and understandability of their financial information:

**H2** Foreign ownership of unlisted companies increases the likelihood to adopt IFRS.

Following previous literature (Di Fabio 2018, Pichler, Cordazzo, and Rossi 2018), we consider that the legal form of private companies influences IFRS adoption. In particular, we assume that joint-stock corporations (in Italy: *società per azioni*) are more likely than limited liability companies (*società a responsabilità limitata*) to voluntarily adopt IFRS. In part this effect can be ascribed to size, since joint-stock companies are generally larger than their counterparts, but also to the larger distance between ownership and control in joint-stock companies, which increases the need for transparent and up-to-date financial information to reduce agency conflicts between managers and shareholders:

**H3** Joint-stock corporations are more likely to adopt IFRS.

Prior literature provides contrasted evidence of the role played by capital intensity on the adoption of IFRS. Therefore, we introduce a non-directional assumption about the role played by capital intensity in affecting the probability of private companies adopting IFRS:

**H4** Capital intensity, measured as the relative weight of tangible and intangible assets, is related to the likelihood to adopt IFRS.

For similar reasons, given the contradicting positions in prior literature regarding the role of financial leverage, we decide not to assume the direction of the effect of this variable, although we expect it to be influential:

**H5** Financial leverage is associated with voluntary IFRS adoption.

Finally, adopting new standards is a long-term decision, and it may be unrelated to short-term circumstances, such as a firm's profitability. Nevertheless, following prior research, we decided to include profitability among our variables, adopting a non-directional hypothesis regarding the effect of a private firm's profitability on the likelihood to adopt IFRS:

**H6** Profitability is related to the likelihood to adopt IFRS.

To test hypotheses H1-H6, we run a binary logistic regression to estimate the association between the probability to adopt IFRS and the firm-level determinants we have identified, a methodology widely applied in previous studies.

$$[2] \text{Prob}_{it}(\text{IFRS}=1) = \beta_0 + \beta_1 \text{SIZE}_{it} + \beta_2 \text{FOREIGN}_{it} + \beta_3 \text{STOCK}_{it} + \beta_4 \text{TANG}_{it} + \beta_5 \text{INTANG}_{it} + \beta_6 \text{DEBT}_{it} + \beta_7 \text{ROA}_{it} + \beta_8 \text{YEAR}_i$$

Where STOCK is a dummy variable that captures the legal form of the company (1 for joint stock corporations, 0 for limited liability companies). The other variables are the same as model [1], described above in this paragraph.

## 5. Sample description and results discussion

We employ a sample of 1,108 Italian private companies voluntarily adopting IFRS over the 2015-2019 time period. To the best of our knowledge, this sample covers the entirety of private companies voluntarily adopting IFRS as of 2019. We decided to drop subsidiaries of listed companies from our sample, under the assumption that the decision to adopt IFRS could be the outcome of a group policy, rather than an independent decision that could be explained by the variables we decided to investigate. We kept companies whose ultimate owner is a foreign entity or individual, when different from a listed company. Once subsidiaries of listed companies, companies with missing data, and companies with negative equity are removed, we are left with 984 unique companies, for a total of 4,883 firm-year observations. To test our hypotheses, we use a control sample of 9,053 unique private companies that report under Italian GAAP, for a total of 45,118 firm-year observations. Our final sample, therefore, comprises 50,001 firm-year observations, all either joint-stock companies (*società per azioni*) or limited-liability companies (*società a responsabilità limitata*), and it covers almost the totality of private companies incorporated in Italy outside the financial industry. Banks, insurance companies, and other financial firms are not included, because, in the years of our analysis, they were required by Italian law to adopt IFRS, even if unlisted. Moreover, including financial firms would have introduced issues of comparability with the financial statement information provided by non-financial companies<sup>3</sup>. Both IFRS adopters and companies reporting under Italian GAAP vary considerably in terms of size and credit rating classification. Descriptive statistics of some key variables for both our IFRS sample and our control sample are reported in Table 2.

Table 2 – Sample descriptive statistics

		Min	Q1	Mean	Median	Q3	Max
<b>Credit score</b>	IFRS	1	5	6.04	6	7	10
	Local GAAP	1	5	6.43	6	7	10
<b>Sales</b>	IFRS	-	21,535	342,836	72,700	252,997	18,917,000
	Local GAAP	2	34,198	129,274	53,985	102,063	32,280,297
<b>Total assets</b>	IFRS	82	30,538	737,197	106,150	390,466	94,043,000
	Local GAAP	108	24,488	115,090	46,021	98,991	19,939,100
<b>ROA</b>	IFRS	-128.61%	0.83%	4.42%	3.76%	7.57%	73.02%
	Local GAAP	-191.75%	2.10%	6.16%	4.70%	8.97%	192.55%
<b>Tangible %</b>	IFRS	0.00%	3.7%	23.23%	15.59%	35.16%	99.68%
	Local GAAP	0.00%	4.37%	19.82%	15.4%	30.39%	98.85%
<b>Intangibles %</b>	IFRS	0.00%	0.38%	13.77%	4.14%	20.91%	93.88%
	Local GAAP	0.00%	0.24%	3.92%	1.05%	3.56%	93.10%
<b>Debt %</b>	IFRS	0.29%	50.58%	64.70%	67.87%	81.76%	99.97%
	Local GAAP	0.85%	51.90%	65.84%	69.23%	82.49%	99.99%

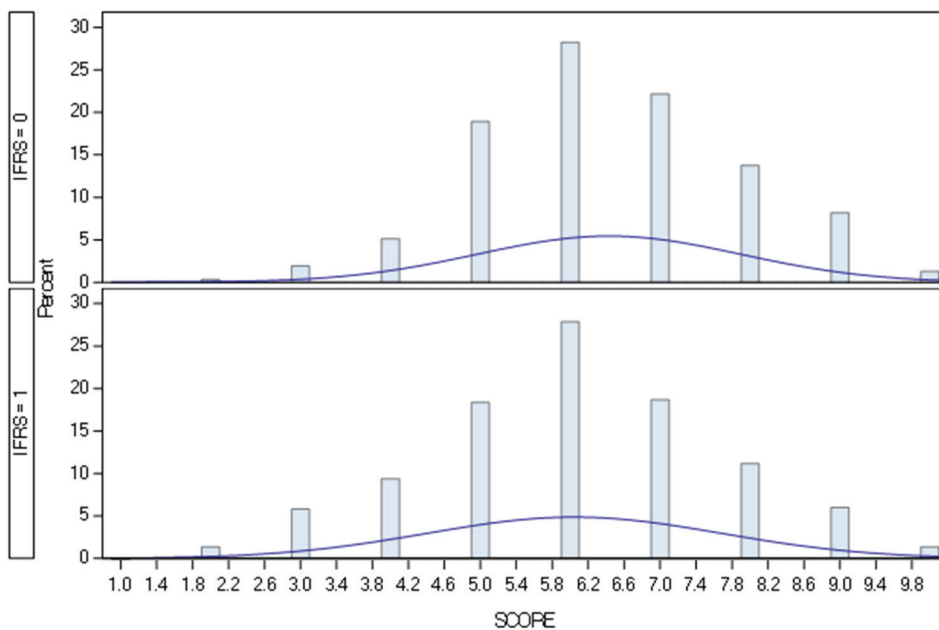
Note: all data in thousands of EUR, except for percentages

<sup>3</sup> This requirement was lifted in 2019: therefore banks, insurance companies and other financial institutions in Italy are not required anymore to adopt IFRS starting from their 2018 financial statements, unless they are listed on a financial market. The effective application of this exemption, however, appears to be limited. See: Germani A., “Per le società non quotate facoltativa l’adozione di IAS/IFRS”, *Guida Normativa*, Il Sole 24 Ore, April 2019, pp. 51-55.

IFRS adopters are on average larger than non-IFRS adopters, both in terms of sales (median sales €72,700 thousand for IFRS adopters, vs. €55,985 for local standards adopters) and total assets (€106,150 vs. €46,021). IFRS adopters have been on average less profitable over the five-year period we examined, compared to companies reporting under Italian standards (median ROA 3.76% vs. 4.70%), reported relatively more intangible assets (4.14% of total assets, vs. 1.05% of local GAAP adopters), while the differences in financial leverage between the two samples are negligible.

Despite the differences in size and profitability, IFRS adopters and companies reporting under local GAAP exhibit a comparable distribution of MORE credit scoring, ranging from D to AAA, with a median and mean score of BB (6, in our conversion scale), i.e. balanced companies, whose performances are adequate considering the sector and the country in which they are operating. Figure 1 shows that both groups of companies show a similar distribution in their credit scorings.

Figure 1 – Distribution of credit scorings for IFRS and Italian GAAP adopters, 2015-2019



Note: IFRS = 1 indicates IFRS adopters, while IFRS=0 indicated companies adopting Italian standards.

Results of the OLS regression for model [1] are reported in Table 3.

Table 3 – Linear regression results (model [1])

Variable	Coefficient	Std. Error	t value	p-value
(Intercept)	9.196013	0.034864	263.769	0.000***
IFRS	-0.147703	0.011423	-12.931	0.000***
FOREIGN	0.085934	0.007413	11.593	0.000***
SIZE	-0.048201	0.002777	-17.359	0.000***
TANG	-0.794404	0.018116	-43.851	0.000***
INTANG	-0.806541	0.033707	-23.928	0.0000***
DEBT	-4.10486	0.016714	-245.588	0.0000***
ROA	8.954006	0.04212	212.583	0.0000***
YEAR.2	0.071147	0.010163	7.001	0.0000***
YEAR.3	0.099919	0.010163	9.832	0.0000***
YEAR.4	0.107623	0.010165	10.588	0.0000***

YEAR.5	0.099937	0.010179	9.818	0.0000***
Adjusted R-squared	0.768			
F-Statistic (sig)	0.0000			

Notes: \*\*\* significant at the 0.0001 level. YEAR coefficients measure the incremental contribution of each year of interest, with YEAR.2 = 2016 and YEAR.5 = 2019. The base year is 2015.

All the coefficients are significant, but our main focus is the IFRS indicator, which is negative and statistically significant: contrary to our expectations, adopting IFRS is negatively correlated with credit scoring. Also, credit scoring is positively affected by profitability and foreign ownership and negatively affected by financial leverage, size, and capital intensity. Year variables are also significant, meaning that changing financial conditions over the years do affect credit scoring.

The independent variables in model 1 are tested for multicollinearity based on the correlation matrix, shown in Table 4, and the variance inflation factor (VIF). Correlation coefficients show that there is a moderate correlation (0.17) between the IFRS variable and the size of the firm, and a more pronounced but still acceptable correlation (0.29) between the choice of adopting IFRS and the percentage of intangible assets. All the correlation coefficients are significant, with the exception of the correlation between the percentage of intangible assets and the financial leverage (DEBT).

Table 4 –Correlation matrix

	IFRS	FOREIGN	SIZE	TANG	INTANG	DEBT	ROA
IFRS	1						
FOREIGN	0.09***	1					
SIZE	0.17***	0.05***	1				
TANG	0.05***	-0.1***	0.23***	1			
INTANG	0.29***	0.11***	0.18***	-0.12***	1		
DEBT	-0.02**	-0.06***	-0.2***	-0.13***	0	1	
ROA	-0.06***	0.03***	-0.1***	-0.11***	-0.08***	-0.3***	1

Notes: \*\*\*, \*\*: Spearman correlation is significant at the 0.0001 and 0.001 level, respectively.

The VIF coefficients, reported in Table 5, are never above 1.19 and do not highlight any multicollinearity issues among the independent variables.

Table 5 – Variance inflation factor (VIF) coefficients

	VIF	Df
IFRS	1.117842	1
FOREIGN	1.032477	1
SIZE	1.178805	1
TANG	1.126721	1
INTANG	1.155588	1
DEBT	1.193785	1
ROA	1.159299	1
YEAR	1.008304	4

Note: Df = degrees of freedom

It is clear that a certain correlation among accounting variables is generally to be expected. However our results, which we can ascribe to the large size of our sample (more than 50,000 observations), seem to prove that multicollinearity is not an issue that affects the robustness of our model. This allows us to



proceed with the second model, a binary logistic regression (model [2]), to investigate the firm-level determinants that can help explain the voluntary adoption of IFRS. Our results are reported in Table 6.

Table 6 – Binary logistic regression results (model [2])

Variable	Coefficient	Std. Error	z-value	p-value
(Intercept)	-6.17668	0.1631	-37.871	0.0000***
SIZE	0.26409	0.01281	20.623	0.0000***
FOREIGN	0.53812	0.03418	15.743	0.0000***
STOCK	0.27598	0.03365	8.203	0.0000***
TANG	1.27126	0.08185	15.532	0.0000***
INTANG	4.99452	0.11636	42.925	0.0000***
DEBT	0.18125	0.08131	2.229	0.026*
ROA	-1.20495	0.21302	-5.657	0.0000***
YEAR.2	-0.00191	0.05074	-0.038	0.970
YEAR.3	-0.01143	0.05071	-0.225	0.822
YEAR.4	-0.03013	0.05072	-0.594	0.553
YEAR.5	-0.06382	0.05084	-1.255	0.209
% correctly predicted	84.44%			
Model Chi-squared	3869.033			
Model Chi-squared sig.	0.0000			

Notes: \*\*\* significant at the 0.0001 level. \* significant at the 0.05 level. YEAR coefficients measure the incremental contribution of each year of interest, with YEAR.2 = 2016 and YEAR.5 = 2019. The base year is 2015.

Consistently with previous research, size, foreign ownership, and legal form variables are positive and significant, thus confirming hypotheses H1, H2, and H3. The year dummy variables are not significant, meaning that there are no appreciable differences in determinants of IFRS adoption among the years chosen for this analysis (2015-2019).

Capital intensity has a positive and significant association with IFRS adoption, both for tangible and intangible assets, thus confirming H4. This is consistent with Di Fabio (2018) and Pichler, Cordazzo, and Rossi (2018), although the latter fail to find statistical significance for this indicator. Our results prove that high entry barriers, measured by capital intensity, tend to influence the adoption of accounting standards that arguably enhance the quality of financial information, probably because of the higher level of transparency of IFRS, an investor-oriented system, compared to that of a creditor-oriented system (Gray 1988), it is not perceived as a threat to the competitiveness of the firm. Our results also highlight the role played by intangible assets, explaining how investments in intangibles constitute barriers to entry, but also are a characteristic of voluntary adopters of IFRS. Given the stricter recognition rules of IFRS, compared to Italian GAAP<sup>4</sup>, we think that this result highlights an important difference between adopters and non-adopters of international accounting standards.

Financial leverage is positively correlated with IFRS adoption and significant at the 5% level (the lowest statistical significance in our model, excluding the dummy year variables), meaning that higher levels of indebtedness increase the probability of voluntary adoption of IFRS. This result once again is consistent with Di Fabio (2018), while other studies fail to report a significant association between this variable and IFRS adoption. IFRS adopters seem to be characterised by stronger financing needs than non-adopters, a view consistent with the assumption that in weak-equity contexts there may be an incentive to switch to IFRS to get better access to credit financing.

<sup>4</sup> Italian accounting standards, after EU Directive 2013/65, have become closer to IFRS. However, they still allow capitalization of start-up and expansion costs, which are not allowed under IFRS.

Profitability, measured as the operating return on assets, is negatively associated with IFRS adoption. This is consistent with Matonti and Iuliano (2012) and Bassemir (2018). Di Fabio (2018) fails to prove a statistically significant connection between financial performance and IFRS adoption, and Pichler, Cordazzo, and Rossi (2018) find a statistically positive correlation only for some of the years they investigated. This variety of results may be explained by the time frame in which the research is conducted, being profitability a short-term indicator, probably not apt to explain a long-term choice such as the adoption of international accounting standards. Our results, however, show that in 2015-2019 lower profitability is associated with a greater chance of adopting IFRS. Since weak equity accounting systems are supposed to be more conservative than IFRS, this result contradicts the assumption that companies may choose IFRS to boost their earnings, especially through fair value gains, probably because the latter has a limited impact on non-financial firms.

## 5. Conclusions

In our study, we show that voluntary IFRS adopters exhibit lower credit scoring, compared to private companies reporting under national Italian accounting standards. This result, however, should not be interpreted as an adverse effect of IFRS standards on credit scoring: to test this hypothesis, it should be necessary to compare the credit scoring for the same firms before and after the adoption of IFRS. Unfortunately, this analysis is not feasible. In fact, exploring the effects of accounting standards on credit scoring would imply the availability, at the same time, of the same financial statements, prepared according to IFRS and national standards.

Our findings also show that IFRS adopters are generally larger than their national standards adopting peers, but, at the same time, exhibit poorer financial performances. Given the lessened relevance attributed to accounting conservatism by IFRS, this result is somehow counterintuitive.

Besides profitability, financial leverage seems to be an important variable to differentiate between IFRS adopters and the rest of the sample. It could be argued, therefore, that higher financing needs seem to provide incentives for IFRS adoption. Nevertheless, voluntary IFRS adopters have worse credit scoring than non-adopters, most likely because of their higher tendency to invest in intangible assets. Credit scoring methods usually tend to penalize large holdings of intangible assets, possibly because they are comparably more difficult to realize in case of financial distress.

The higher degree of investments in intangible assets remains a characteristic that requires further investigation, also because IFRS are stricter than Italian national accounting standards regarding the recognition of intangible assets. This difference in asset structure is probably due to an industry effect, which calls for further research on the characteristics of voluntary IFRS adopters.

Finally, further research may be extended to other national contexts, provided the necessary data is available.

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