Do IFRS support debt issue for European private companies?

Jérémie BERTRAND[1]

IESEG School of Management

Hélène de BREBISSON[2]

IESEG School of Management

Aurore BURIETZ[3]

IESEG School of Management, LEM-CNRS 9221

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Abstract: This paper studies the impact of IFRS adoption on debt issue. Our empirical analysis investigates whether privately held firms located in Europe can raise debt better when they report their consolidated financial information in IFRS. Using fixed-effect regressions on 15,965 firms in 22 countries during the 2005-2018 period, we show that IFRS adoption leads to a better private debt issue for non-listed firms especially if the firm is more opaque, or is located in a Common law country. Our results remain the same regardless of the specification and are robust to several alternative tests.

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[1] Lecturer, Finance Department, IESEG School of Management, 3 Rue de la Digue, 59000 Lille, France. Tel.: +33 320 54 58 92. Email: j.bertrand@ieseg.fr.

[2] Assistant Professor, Audit and Control Department, IESEG School of Management, 3 Rue de la Digue, 59000 Lille, France. Tel.: +33 320 54 58 92. Email: h.stefaniutyn@ieseg.fr.

[3] Assistant Professor, Finance Department, IESEG School of Management and LEM-CNRS 9221, 3 Rue de la Digue, 59000 Lille, France. Tel.: +33 320 54 58 92. Email: a.burietz@ieseg.fr.

Introduction

The choice of accounting practice is crucial for a firm as it can have an impact on its business and its financing policy. A company expanding its operations across borders may prefer to opt for international accounting standards to reach comparability while a firm issuing equity on a foreign stock exchange market should adjust to local accounting practices to meet the listing requirements. El-Gazzar et al. (1999) investigate the objectives of firms that voluntarily adopted the International Accounting Standards (IAS). The authors argue that implementing the IAS not only enhances cross border trade and financing but also provides creditors with a better understanding of foreign firms' credit risk. These conclusions emphasize the importance of clarifying and harmonizing firm's accounting disclosure policies to increase transparency, albeit decrease opacity, and support the firm's activities.

As such, the International Financial Reporting Standards (IFRS) have been adopted since 2005 in more than 130 countries to facilitate the harmonization and development of financial markets. In the European Union (EU), IFRS are mandatory for the consolidated accounts of listed entities while they may be optional for non-listed firms (Brébisson & Alphonse, 2018). The literature studying the impact of the mandatory IFRS adoption by listed firms highlights significant benefits for firms. Previous studies document positive and significant capital markets reactions to the implementation of IFRS with a strong influence of the enforcement regime (Armstrong et al., 2010; Li, 2010; Byard et al., 2011; Brüggemann et al., 2013; De George et al., 2016;). However, the literature remains relatively scarce when considering privately held groups. Christensen et al. (2015) run a single-country analysis to evaluate the impact of IFRS adoption on accounting quality changes. They focus on Germany where IFRS were allowed for listed firms and common before becoming compulsory. The authors show an improvement in accounting quality for voluntary or early adopters, i.e. entities anticipating the application of a future rule. Moreover, they highlight that firms with close relationships with their lenders have less incentives to adopt a more comprehensive set of rules. In a larger sample of countries, Renders and Gaeremynck (2007) argue that the level of investor protection as well as the corporate governance codes affect a firm's decision to adopt IFRS. The authors explain that firms located in countries with strong law and corporate governance frameworks have more incentives to adopt IFRS as the marginal cost of being more transparent is smaller.

In the majority of EU Member States, non-listed companies have an option to produce their consolidated financial statements in IFRS to satisfy either shareholders' or creditors' needs, following IFRS Conceptual Framework (IASB, 2010). In this study, we further investigate firms' motivations behind the decision to adopt IFRS. On the one hand, these standards may be required by investors, either for valuation purposes in the context of an IPO or private equity issue, or for contracting reasons i.e. to steward the performance of the company. On the other hand, lenders for contracting reasons i.e. to provide debt may request these standards. Contrary to listed firms that voluntarily anticipated the mandatory use of IFRS, the literature is not clear why non-listed entities may opt for IFRS. As such, this paper focuses on firm's access to debt to explore one possible motivation for non-listed companies to opt for IFRS in their financial reporting. We examine the debt ratio in privately held companies located in Europe over the 2005-2018 period. Using a fixed-effect regression on panel data, we show that the level of debt weight in the capital structure increases when firms use IFRS instead of local GAAP. This result tends to suggest that IFRS facilitate credit access for non-listed firms through opacity reduction. We show that IFRS may facilitate debt access especially to opaque firms or firms in weak informational environments. Our results are robust to different specifications as well as to the use of the matching methodology.

This paper contributes to the existing literature on the impact of IFRS adoption on firms' access to funds. Besides the large literature dedicated to the impact of IFRS adoption on capital markets, a growing literature tries to understand the standards' impact on the credit market. Florou and Kosi (2015) study whether IFRS facilitate debt access to listed entities and show a higher propensity for these firms to issue public debt rather than private debt. De Lima et al. (2018) focus on the credit market in Brazil where IFRS became mandatory. The authors conclude that firms adopting IFRS better access to debt only if they seriously and honestly implement these new accounting standards. Studying the credit market instead of the capital market adds to the debate on the general impact of IFRS adoption, as creditors' needs and uses of financial information may differ from shareholders' ones. Moreover, debt financing is one of the major sources of funds for companies. Ball et al. (2008) even claim that the selection of accounting standards is more influenced by the credit market expectations than the capital market ones.

Our analysis also adds to the debate on firms' motivations to change their accounting standards. A large majority of accounting research papers assesses the impact of IFRS on firms'

communication and valuation, cost of capital, loan contracts and relationships with investors, in a context of mandatory adoption (Wu & Zhang, 2014; Florou et al., 2017). We complement these papers by considering the case of private companies in Europe as a unique setting of non-mandated firms opting for IFRS. These firms may be less constrained in terms of communication with a free choice to publish their financial information in either one of two possible sets of accounts, i.e. the local one or the international one. Identifying why these privately held entities opt for IFRS improves our understanding of the role of accounting standards. It contributes to the debate surrounding the objectives of financial information – valuation or stewardship – and the status of the international standards with respect to both these objectives.

Finally, we aim at understanding which kind of private entities opt for IFRS to add to the regulatory debates at the European and National levels. After the adoption of IFRS by listed companies, EU debated on whether to adopt the IFRS-for-SMEs rule for other entities. Finally, EU adopted the 34th Directive in 2013 that establishes a list of common accounting principles supporting the harmonization of local rules (André, 2017). However, non-listed companies still have the choice to adopt the full IFRS set of standards or not. Hence, the reasons behind this choice have to be clarified to provide the accounting authorities, both at the European and National levels with a clear framework to design future accounting regulation.

The remainder of the paper is organized as follows: section 1 reviews the literature, section 2 presents the data and methodology, section 3 develops the results, section 4 displays our robustness tests and section 5 concludes.

1. Literature Review

1.1. IFRS mandatory adoption: objective and impact for listed firms

In Europe, the rule n°1606/2002 mandates listed groups to publish their consolidated accounts in IFRS. Then, each Member State is free to enlarge the use of IFRS to other types of entities. A number of countries have left private groups the option to choose between local GAAP and IFRS for their consolidated reporting. This reform is part of a worldwide movement to adopt international standards for some or all entities in more than 130 countries. The common objective of adopting countries is to reduce information asymmetries between issuers and funds providers, through both an improved reporting quality and an enhanced comparability between

issuers, in particular for cross-country operations.[4] Beneish et al. (2015) show that IFRS adoption improves more the quality of financial reporting than the comparability of equity and bond markets. However, the quality of financial reporting relies on managers' reporting incentives and accounting enforcement that may differ from one country to another (Christensen et al., 2007; Barth et al., 2008; Fox et al., 2013 among others) . As an example, Jeanjean and Stolowy (2008) show that the pervasiveness of earnings management has not declined in Australia and the UK, it has even increased in France on the first year of IFRS adoption. In addition, while the literature provides evidence that IFRS adoption improves the quality of reporting mainly for companies with specific incentives (Daske et al., 2013), or in effective legal environments (Christensen et al., 2013), some studies consider IFRS as a way out in weak legal environments. De Lima et al. (2018) analyse the Brazil case and underline that the impact of IFRS is all the more important that Brazil has a low level of law enforcement and credit protection. Overall, the literature underlines the role of individual and institutional incentives in enhancing reporting quality (Ball et al., 2000).

Furthermore, previous studies document positive and significant capital markets reactions to the implementation of IFRS with a strong influence of the enforcement regime (Li, 2010; Brüggemann et al., 2013). Armstrong et al. (2010) run an event study on European stock exchanges between 2002 and 2005 and document a significant and positive market reaction to events encouraging the implementation of IFRS. However, they mitigate their conclusions highlighting in particular a negative market reaction for firms located in countries with low investors' protection. This result reflects investors' concerns regarding the enforcement of IFRS. Byard et al. (2011) investigate more precisely the effect of IFRS use on analysts' forecasts. The authors show evidence of a decrease in forecasts' errors following the adoption of IFRS, especially if the firm is located in a country with strong enforcement regime. Bilinski et al. (2013) confirm their results. Moreover, DeFond et al. (2011) argue that IFRS significantly improve comparability by reducing information acquisition costs for global investors and result in larger cross-border investments. To summarize, the empirical studies show a positive relationship between IFRS implementation and not only the performance and the efficiency of

[4] De George et al. (2016) provide an extensive literature on the objectives, the effects on corporate decision-making and the different research designs surrounding the IFRS adoption.

capital markets but also the growth in foreign investment (Barth et al., 2014; Beuselinck et al., 2009).

A growing literature also investigates IFRS consequences on debt markets.[5] Naranjo et al. (2014) find that, for listed companies, IFRS mandatory adoption is associated with a better access to public sources of funds but Florou and Kosi (2015) add that it is not associated to private debt market nor to a more competitive cost of debt. In line with these conclusions, Kim et al. (2011) confirm a positive relationship between IFRS use and loan amounts while the link is negative with interest rates levels. As such, a borrower adopting IFRS enhances its ability to raise debt at a lower cost. On the contrary, Chen et al. (2015) provide evidence of an increase in syndicated loan costs and a decrease in maturity for borrowers using IFRS. The authors argue that it depends on how lenders assess the level of quality of IFRS versus local GAAP. Moreover, De Lima et al. (2018) focus on the credit market in Brazil where IFRS became mandatory and conclude that firms adopting IFRS have a better access to debt only if they seriously and honestly implement these new accounting standards. According to the authors, IFRS impact is all the more important that the country has a weak legal enforcement and credit protection. Hence the accounting standards play a counterweight role, helping issuers to signal themselves (Spence, 1973).

1.2. IFRS non-mandatory adoption: motivation and impact

Beyond the mandatory adoption of IFRS that has been widely studied, the reasons why non-listed groups choose the international standards are not clear yet. The existing literature provides insights regarding the voluntary adoption of IFRS by listed groups before the standards became mandatory (Christensen et al., 2015; Francis et al., 2008). Christensen et al. (2015) focus their analysis on Germany where listed firms had a choice to adopt the IFRS or not starting in 1998 until 2005 when the international standards became mandatory. The authors show a significant improvement in reporting quality, i.e. lower earnings management, better loss recognition and value relevance for voluntary adopters. Bassemir (2018) explores the reasons for German private firms to opt for IFRS, starting when IFRS were not yet mandatory for listed

[5] On the one hand, accounting contributes to reduce information asymmetry between lenders and borrowers by providing lenders with information about managers' private and forward-looking information enabling them to price the debt correctly (valuation role). On the other hand, accounting supplies timely and auditable performance measures of borrowers' creditworthiness that can be used in efficient contracts with the firm such as debt covenants (contracting role) (De George et al. 2016).

firms, even before European countries voted for IFRS. His results suggest that opting firms have important financing needs and international activities. Bassemir and Novotny-Farkas (2018) identify four main reasons to adopt IFRS using a similar sample of German private firms: getting access to public equity, getting access to public debt markets, fulfilling the expectations of private equity shareholders, and developing international activities. In the first three categories, firms adopt IFRS mainly for financing needs and valuation issues while the last category related to firm's reputation concerns companies that would choose IFRS for comparability hence contracting purposes. One potential interpretation of these results is that a major determinant to opt for IFRS is, in fact, to get prepared for future mandatory application following equity or bond IPO. Private equity sponsors can also influence private firms towards IFRS as a way to prepare firms to a future IPO or a future merge with a listed firm. These cases may finally be early adoption of future mandatory rules.

The underlying hypothesis on voluntary IFRS adoption by listed firms is that they signal high quality. Listed entities indeed communicate to a large number of investors who will value their investment and compare it to the value of other issuers. Chan et al. (2013) highlight a significant improvement of credit ratings after the adoption of IFRS. The signaling hypothesis (Spence, 1973) is all the more important as the market is highly competitive. However, Nobes (2010) warns that in the case of privately held entities "there is no public to signal to. The providers of finance to such a company (e.g. family members and bankers) are likely to be better informed than the public about the affairs of their company, and so it will be less worthwhile to try to signal higher quality to them" (p. 218). As such, Chen et al. (2013) emphasize the importance of accounting information quality regarding the financing decisions of a firm. The authors argue that companies with a low accounting credibility, proxied by the number of accounting restatements, rely more on debt than equity due to higher information asymmetry problems, the latter being less an issue for debtholders who may obtain the relevant and required information through private channels. However, private firms sometimes seek for new sources of funds to develop specific projects. This could lead them to prepare an IPO, or introduce a new investor from the Private Equity (PE) or Venture Capitalist (VC) sector. An alternative is asking for new bank loans. Yet the historical banking partner may not be able to fully fund major investment projects and have to build a syndicated loan. In this case, the private firm borrows from a syndicate i.e. a group of banks including new partners requiring a higher level of quality regarding financial information. As such, when a private group raises funds from new sources, one motivation to change the accounting standards could be improving the communication to

new financial partners, which turns back to the signaling theory. Moreover, the syndicated loan market is an international market which amounts for one third of the international financing, the latter including commercial papers, bonds and stocks (Gadanecz, 2004). Having access to this international debt market is one potential motivation for private companies to adopt IFRS. Balsmeier and Vanhaverbeke (2018) observe that private firms opting for IFRS are associated with a higher propensity to attract debt from foreign banks, inducing the increased comparability of IFRS information. In addition, Hope et al. (2011) show evidence of a better access to external finance for firms with greater financial reporting credibility especially when those firms are located in countries with a low level of creditors' rights protection. Hence accounting standards could help firms to reduce their opacity especially when the legal or informational environment does not, which is particularly important for non-listed or SMEs firms (Haselmann & Wachtel, 2010; Jappelli & Pagano, 2002; Jappelli et al., 2005). Belletante and Levratto (1995) set forth a communication issue related to SMEs more reluctant to disclose financial information.

1.3. Contribution to the literature

While IFRS can be used to reduce firms' opacity, it is not clear though to which actor private entities should signal to, if they should signal at all. Would this justify to opt for IFRS? Nobes (2010) shows that it is difficult to use the literature based on listed companies to build hypotheses on private firms' behavior, due to major differences between the shareholders structures. In addition, it is not clear whether opting for IFRS would have a better impact in environments with a strong legal enforcement that would ensure reporting quality, or if it would be more efficient when the legal or informational environment is weaker.

In this paper, we contribute to the debate surrounding the possible reasons why IFRS are chosen by firms while they are not forced to. More precisely, we investigate whether publishing information using IFRS provides private groups with a better access to debt. Studying the debt market instead of the capital market adds to the debate on the general impact of IFRS adoption, as creditors' needs and uses of financial information may differ from shareholders' ones. Moreover, debt financing is one of the major sources of funds for companies. Ball et al. (2008) even claim that the selection of accounting standards is more influenced by the credit market expectations than the capital market ones.

2. Data and Methodology

2.1. Data

Our empirical analysis is based on Orbis database. Our initial sample is composed of active European non-listed or delisted firms since 2005, producing consolidated accounts. To allow comparability, we keep only large firms, as defined by Orbis, i.e. with at least one of the following thresholds passed: Total Asset equal or more than EUR 20 million, Turnover equal or more than EUR 10 million, and number of employees equal or more than 150. We keep entities that passed one of the following thresholds at least twice over the 2005-2018 period.

Since we focus on non-mandatory IFRS adoption, we excluded groups from Member States where IFRS were not allowed for non-listed companies and countries where IFRS were mandatory for consolidated accounts of non-listed groups (i.e. Cyprus, Bulgaria, Slovakia and Czech Republic). The only country where IFRS were not allowed in consolidated accounts was Croatia, for only a part of non-listed companies. Since we cannot control if our Croatian firms are allowed to use IFRS, we keep these firms.[6]

We also remove all firms whose last owners are private equity or venture capitalist actors, hedge funds, pension funds, trustees. By this, we exclude the potential influence of specific shareholders on the choice of standards, to concentrate on the links with debt.

Finally, we remove FIRE (Finance, Insurance, Real Estate) and public or governmental entities due to their specificities and all observations with missing information over the 2005-2018 period.

We collect basic financial information on firms' consolidated balance sheets and income statements using Orbis. The database also provides the standards used by the firms, i.e. IFRS or Local GAAP.

Our final sample contains 15,591 firms over the period 2005-2018 for a total number of 70,642 observations dispatched over 22 European countries (see Table 1 for the distribution of our sample through countries).

[6] In a robustness test, we exclude Croatian firms and our results remain highly similar, see section 3.3.2.

2.2. Methodology

Our model investigates whether the application of IFRS is a significant determinant of the firm's debt access. Based on this information we build our database using panel data and we run the following model using fixed-effects estimation approach:

$$Debt_{i,t} = \alpha + \beta * IFRS_{i,t} + \sum_k \gamma_k * (\boldsymbol{firm\ char.})_{i.t-1,k} + \sum_g \delta_g * (\boldsymbol{country\ char.})_{i,t,g} + \theta * firm - FE_i + \vartheta * year - FE_t + \varepsilon_{i,t}$$

To analyze the impact of IFRS adoption we use $IFRS_{i,t}$ a dummy equal to 1 if the accounts are in IFRS in year *t* for firm *i*, and 0 if the firm is in Local GAAP. This data is directly given by Orbis database (for a complete description of all variables, see Table A1 in annex).

$Debt_{i,t}$ is our dependent variable $Debt/Asset_{i,t}$, which represents the ratio of private debt on total asset for firm *i* at time *t*.

As control variables and in line with prior studies (Florou et al., 2017; Florou and Kosi, 2015) we control for **firm characteristics**. We measure observable firm's characteristics such as its size (through its total assets), its age, its profitability, using the ROA, and its growth through the sales growths. Since opacity is an important determinant of non-listed firms' access to credit (Berger and Udell, 1998), we control for firms opacity using its tangibility, and for information about its risks, using firms' *O-Score* (Ohlson, 1980), which is a measure of distress risk; the higher the score, the higher the risk. All these control variables are taken with one lag to avoid any problem of endogeneity.

We also control for **country characteristics**, as literature has proven the impact of legal procedures (Wu & Zhang, 2014) and informational environment (Jappelli and Pagano, 2002) on the use of debt and on potentially IFRS adoption. We control for the legal system with a dummy equal to 1 if firm's country uses *Civil Law*; we use yearly measures of law enforcement through the *Rule of Law* index; finally we proxy the informational environment for creditors through a measure of *Information Index*. All these country measures come from the WorldBank DoingBusiness database.

Finally, as explained by De George *et al*. (2016) "there are no clear prescriptions for many of the econometric choices involved in IFRS studies" (p.68), this means that there are no theoretical framework concerning the use of fixed effect and clustered standard errors. Thus, as we use panel data, we decide to control for time and firm fixed effect in our main estimation. However, to test the sensitivity of our results, we also make estimations using several alternative fixed effects and clustered standard errors as seen in the literature.

2.3. Summary statistics

Table 2 displays the descriptive statistics of our sample and the results of a mean difference test by accounting practice for all independent variables.

First, we can see that only 6.5% of our sample use IFRS, which represents 4,795 observations.

If we look at our debt variable, we can see that companies have on average about 20% of private debt in their capital structure. It is also interesting to note that, on average, companies adopting IFRS have 5.3% more debt in their capital structure than companies under local GAAP (these companies have respectively 24.8% and 19.6% of debt on asset). This first result seems to be in line with our assumption that IFRS allow firms to have access to more debt.

Table 2 also highlights significant differences for all control variables, except the sales growth, when comparing firms in IFRS to firms in local accounting practices. Our findings seem in line with the previous literature (Affes & Callimaci, 2007; André et al., 2012; Erkens, 2016) as firms adopting IFRS standards are bigger, riskier, less performant and more tangible than firms using local GAAP. They also have a higher probability to include a BIG 4 auditor in their audit team. The only surprising result comes from the age. We expected that older firms disclose more in IFRS than younger ones, however our univariate analysis shows the opposite, which can be related to their risk, i.e. younger firms would use IFRS to send a signal.

3. Results

3.1. Main results

Table 4 presents the results of our main estimation model. The objective is to see if firms adopting IFRS voluntarily issue more debt than other does.

As explained previously, there are no clear rules concerning the use of fixed-effect or clusters in models, hence we test the sensitivity of our results using different fixed-effect or clusters.

Model (1) is our main estimation and includes firm and year fixed-effects. Model (2) replicates the main estimation with standard errors clustered by country[7]. In models (3) to (10) we base our estimations on different combinations of year, country and industry fixed-effect.

Whatever the specification, IFRS is always positively and significantly associated with *Debt/Asset* ratio: firms using IFRS tend to increase significantly the share of debt in their capital structure. Firms using IFRS have on average between 2.9 and 4.6% more debt than firms in local GAAP. We argue that the adoption of international accounting standards support firms' access to the debt market, in line with de Lima et al. (2018).

Regarding the control variables, the results provided by the models show a *Debt/Asset* ratio negatively associated with performance. Firms with low performance may have low access to debt. *Tangibility* has a positive and significant impact on the *Debt/Asset* ratio, which is in line with the pecking order theory (Frank and Goyal 2003), where tangibility is negatively correlated to information asymmetry. Interestingly, the size and the age have a negative and significant relationship with the *Debt/Asset* ratio, which is surprising. We suggest that bigger or older firms have a relatively lower propensity to borrow considering their equity level. Another explanation is that larger and older firms have several alternative sources of funds and are less dependent on debt compared to smaller companies. The *O-Score* is positively associated to *Debt/Asset* ratio, which suggests that firms that present higher risks are more leveraged. Finally *Sales Growth* presents a negative correlation with *Debt/Asset* ratio. The more leveraged structures would be concentrated on firms with low sales growth rates.

3.2. Understanding the mechanism

In this section, we further investigate the role of IFRS using interaction variable analysis. The idea is to understand how the link between IFRS adoption and debt access works.

3.2.1. Informational and Legal Interaction

We first make an analysis based on the country informational environment. In the main estimation, we use the *Information Index* to control for the global informational environment.

[7] We also estimate our model using industry and firm clusters and results remain the same. Results are available upon request.

This measure includes the presence of credit bureau/registry, but also the availability and the way to access to information. In this section, we want to focus on the level of information asymmetry on the market, to test our hypothesis of opacity. Indeed, in an environment with a low information asymmetry, the benefit of adopting IFRS can be lower than in a country with a high information asymmetry. Jappelli and Pagano (2002) prove that the larger the number of credit bureau or credit registry, the lower the information asymmetry on the credit market. Indeed, credit bureau or registry help to reduce information asymmetry between borrowers and lenders. Hence, we can wonder if firms in a country with a strong presence of credit bureau or registry have less benefit from IFRS adoption than others. To test that, we interact our IFRS variable with Credit Bureau Coverage (see Table 5 column 1) and Credit Registry Coverage (column 2). IFRS variable remains always positive and significant, but only the interaction term IFRS x Credit Registry Coverage is negative and significant. This means that the higher the percentage of companies registered in a public register, the less IFRS improve debt access. This is in line with our intuition that IFRS and the information environment play the same role in reducing information asymmetry. It is interesting to note that our results are valid only for public registries (Registry) and not for private registries (Bureau). This could be interpreted as a question of access to information (most public registries are cheaper to access than private bureaus).

Secondly, Wu and Zhang (2014) and Karahan et al. (2016) explain that countries under Common law, such as the United Kingdom (UK), have stronger investor protection and higher disclosure levels of financial information than countries under civil law. This means that our results could be driven by the legal environment. To test this hypothesis, we interact our IFRS variable with two legal variables: Rule of Law and Civil Law (Table 6). First, whatever the specification, we note that our IFRS measure is always positive and significant. Then, turning to our interaction variable, only IFRS x Civil law is negative and significant. This means that when a firm adopts IFRS and is in a Civil law country (i.e., France or Belgium for example) its access to credit is improved (as the sum of both coefficients remains positive and significant), but less than in a Common law country. This could be explained by the fact that the distance between accounting practices is higher in Civil law countries between local accounting rules and IFRS (Ding et al., 2005; Ding et al., 2007).

3.2.2. Firm Characteristics Interaction

In this section, we interact our IFRS variable with several firms' characteristics. The idea is to see if firms' characteristics can drive the benefit of using IFRS. Indeed, while IFRS allow firms to reduce their opacity, some firms, those that are naturally not very opaque, for example, will have less advantage than others in using these standards. Thus, in Table 7, we interact our IFRS variable with different proxies of firm's opacity: tangibility (high tangibility means low opacity - column 1), size (small firms are opaquer than large firms - column 2), age (young firms are opaquer than old firms - column 3), and its risk (higher opacity leads to higher risk - column 4).

About tangibility (column 1), the interaction variable IFRS x Tangibility is negative and significant. This means that a highly tangible firm (i.e. low opacity) using IFRS has a lower debt. This confirms our intuition that IFRS are being used to reduce opacity, because a firm that is tangible, so not very opaque, will have less benefit from using IFRS than an opaque firm.

Considering the size (column 2), the higher the size of a firm adopting IFRS, the lower its benefit in terms of access to debt. Being small may decrease the number of potential sources of funds, mainly due to their opacity. So small companies have a greater incentive than large ones to use IFRS because they know they will benefit more from it. As such, small firms may have the same incentive as high-risk firms previously mentioned to use IFRS to attract new lenders and benefit from a better access to the debt market. On the contrary, there may be no significant change in the capital structure of large firms even if they may borrow more.

Regarding the age (column 3), we note that the interaction term is not significant.

Finally, considering the risk (column 4), the higher the risk supported by a firm adopting IFRS, the higher its access to debt. We can analyse this result through the signalling theory. Firms with a higher O-Score represent a higher level of risk and may suffer from a lack of sources of funds. As such and despite the burden and complexity of changing their accounting standards, these high-risky firms may have an incentive to adopt IFRS to become more transparent and have a better access to the debt market.

It is interesting to note that, except for age, all our variables are in line with our initial intuition: the most opaque firms benefit more from the use of IFRS in their access to debt than the least opaque firms.

3.3. Robustness tests

3.3.1. Alternative measure of debt

In this section, we test an alternative measure of debt: the natural logarithm of the amount of debt. We follow the same methodology as previously, we control for the same variables and we test several potential fixed-effect and clusters.

Table 8 displays our results for our alternative measure of debt. We can notice that, whatever the specification, the coefficient of the IFRS variable is always positive and significant. This means that firms using IFRS have a higher debt value than others and supports our initial results.

3.3.2. Alternative samples

We are aware that our results could also be driven by our sample and by some bias in it. The aim of this section is to control for these potential biases using alternative samples (results Table 9).

As explained previously, IFRS are not allowed for a group of non-listed companies in Croatia, however we cannot know if firms in our sample are allowed or not to adopt it. As we keep these observations in the main estimation, Column 1 displays our results for the sample excluding Croatian firms and shows that our result remains the same.

A second bias can come from the UK since it represents proximally 1/3 of our sample and we would like to verify that our results are not driven by one country only. So, we run our estimation on a sample excluding UK (column 2) and observe similar results.

Finally, a third problem can come from the quality of the data. André (2017) highlights some potential mistakes in the registration in Orbis accounting practice variable. He takes the example of Portugal where the number of IFRS firms is too important. To manage this potential quality problem, we first test our estimation on a sample excluding Portugal (since André clearly points out this country, see column 3). Secondly, we exclude countries with less than 5% of IFRS firms (what we called *Doubt Practice*, see column 4). Finally, we use a sample excluding invariant countries, i.e. countries with firms using only one set of standards (*Invariant*

Practice, see columns 5 and 6 together with *Doubt Practice*). We can note that our results remain the same whatever the sample used.

3.3.3. Self-Selection bias

As explained by De George *et al.* (2016) self-selection bias can represent a big issue in a study about voluntary adoption. Indeed, companies may decide not to adopt IFRS, for their own reasons, and thus bias the results. In order to control for this potential bias, we follow the same methodology as Leuz and Verrecchia (2000), using a two-stage Heckmann (1979) estimation approach. In the first step, we use a Probit model to estimate the probability that a firm adopt the IFRS standards, then, we compute the inverse Mills ratio[8] and we include it in our second step, which corresponds to our main equation.

In our first step, we model the probability that a firm adopt IFRS using the same model as Leuz and Verrecchia (2000) and Daske (2006). As independent variables, we use the naturel logarithm of total assets, the tangibility (also named capital intensity in some papers) and the ROA, as proxies for the firm size, financing needs and performance. Leuz (2003) shows that the first two variables are positively related to the adoption of IFRS, while the results on the last one are more mixed. We also control if the firm is in a country of common law, since IFRS could be easier to adopt as local standards are less distant from them. We finally control for the presence of a BIG4 auditor in the firm's audit team, as these may support IFRS implementation (André et al., 2012).

Table 10 displays our results for the Heckman estimation. A quick look at the first step (column 1) shows that IFRS is positively related to firm size and financing needs, as in Leuz (2004). Firms in common law countries adopt IFRS standards more than in civil law countries, which confirms our first intuition. Finally, IFRS adoption is positively related to the presence of a BIG4 in the firm's audit team.

Regarding the second step (column 2), we note that our IFRS variable remains positive and significant, even after controlling for the inverse Mills ratio. We also observe that this ratio is

[8] The Mills ratio is calculated as follows: $\lambda(.) = \frac{\phi(.)}{\Phi(.)}$, where $\phi(.)$ is the standard normal density function and $\Phi(.)$ is the standard normal cumulative distribution function of the linear prediction of our dependent variable.

negative and significant, which confirms that negative selection has occurred. Without this correction, the estimate coefficient of IFRS would have been downward-biased estimate[9].

3.3.4. Instrumental variable

Following previous literature (e.g. Leuz & Verrecchia, 2000; Van Tendeloo & Vanstraelen, 2005), we are aware that our results can be bias by some (unobservable) variables that both affect IFRS and debt access and that could lead to a potential bias such as simultaneous causality issue. For example, a firm knowing it can be difficult to access new debt (due to their opacity for example) could decide to adopt IFRS to facilitate debt access. Hence, our IFRS variable could be potentially endogenous.

To solve this problem, we use an instrumental variable regression following the methodology explained by Larcker and Rusticus (2010). The authors explain that it is important to first address the endogeneity problem then to implement correctly the IV regression and all the tests needed to assess the model quality. They also underline the difficulty to find a valid instrument.

As instrument, we decide to use the presence of a BIG 4 in the firm's audit team. Indeed André et al. (2012) or Affes and Callimaci (2007) show that the presence of a BIG 4 is directly linked to the IFRS adoption. Moreover, in our sample BIG 4 is significantly highly correlated to IFRS. However, it has no direct link with the debt level (there is no correlation between BIG4 and our dependent variable).

We use a probit model, since IFRS is a dummy, and run the following estimation:

$$IFRS_{i,t} = \pi_0 + \pi_1 * BIG4_{i,t} + \pi_2 * \boldsymbol{Control} + \varepsilon_{i,t}$$

Where IFRS is our potential endogenous variable, BIG4 is our instrumental variable and Control is a vector containing all control variables from our main estimation.

After the estimation, we run the Hausman Specification Test to see if IFRS and Debt / Asset are endogenous. If the test is (not) significant, it means that both variables are (not) endogenous and that the best model is IV (OLS) regression (Maddala, 1986). In our case, the p-value of the Hausman test is equal to 0.6066, this means that our main estimation does not suffer from an

[9] For a complete explanation of how to interpret the mill-ratio, see Kai & Prabhala (2007).

endogeneity bias caused by omitted variables (Van Tendeloo and Vanstraelen, 2005). Hence, the best model to use is a simple OLS rather than IV regression.

3.3.5. Propensity score matching

In our main model we run a fixed-effect regression to assess the impact of adopting IFRS on the debt-to-asset ratio or debt level in private companies controlling for the firm's and country's characteristics. However, even if fixed-effects allow us to control for multiple characteristics, due to data limitations, we cannot directly control for the characteristics of the project financed with the new loan. One solution to overcome this problem of missing data would be to apply a propensity score matching method (Ioannidou and Ongena, 2010).

The aim of this technique is to first gather companies that share similar characteristics (for example the size, the industry…), then in a second step regress the dependent variable, in our case *Debt/Asset*, on a treatment dummy, here equal to one if the firm applies IFRS. As such the dummy is the only remaining difference between two groups of similar companies which are assumed to share the same investment opportunities.

We follow the methodology explained by Shipman et al. (2017) and in line with previous literature (Florou *et al.*, 2017; Florou and Kosi, 2015) we match firms based on all the previous variables used in our model. We use firms' country, sector, size, ROA, tangibility, risk score, sales growth, the year and country characteristics such as the rule of law, the credit bureau coverage and the type of law. The idea is to match firms based on common characteristics that can explain the level of private debt. We use a nearest-neighbour matching method.

Table 11 displays our results for propensity score matching analysis for *Debt/Asset* variable.

If we look at the results, firms that use IFRS have higher debt-to-asset ratios than firms in Local GAAP.

4. Discussion and Conclusion

This paper has appraised the impact of IFRS voluntary adoption on the debt level. We have postulated that IFRS could help firms to access to debt, through a reduction in their opacity. To answer this question, we estimate a panel data regression on sample of 15,965 European private firms between 2005 and 2018.

Our findings show that IFRS voluntary adoption for non-listed groups is positively associated with the *Debt/Asset* ratio. The choice for IFRS is all the more beneficial that firms need to reduce information asymmetry related to country conditions or own opacity.

Indeed, we argue that a strong informational environment affects the benefit of firms adopting IFRS. The larger the presence of credit registry, the lower the benefit of using IFRS on debt issue. Regarding the legal environment, IFRS adoption tends to be more beneficial in Common than in Civil law countries, since the distance between local GAAP and IFRS in the latter is larger and may bound the reduction of information asymmetry.

Moreover, specifically opaque firms may opt for IFRS to signal their quality. In particular, the switch to IFRS could serve as a signal for more risky, smaller or less tangible firms. The adoption of IFRS by non-mandated firms in Europe could then be interpreted with the signal hypothesis. Non-listed companies may have to find new partners that do not have the inside knowledge of the main stakeholders. IFRS may help firms reducing their opacity. This could suggest that IFRS may be used for contracting purposes, which would be relatively new, as the international standards have been long studied from the valuation perspective.

Our results are stable over various fixed-effect and cluster specifications. They are robust to alternative variable and samples, self-selection and endogeneity tests. They are also confirmed through the use of propensity score matching method.

Nevertheless, our work shows several limits: at this stage our debt measures are only proxies to debt access. The *Debt/Asset* ratio may show structures of funding. It could also be interpreted as a choice for debt versus equity as a fund driver. Last, these variables are modified by the standard move itself. Even if in Europe many countries have converged their local accounting standards to IFRS, differences remain, in terms of rules or practice that may change the debt levels and ratios. Finally, even if we try to control for, another limit is related to Orbis database itself that was questioned on the variable related to the accounting practice by André (2017).

However, our results are robust and coherent enough to let us propose that IFRS may be chosen by private entities voluntarily to improve their access to debt. These results contribute to the debate on the role of accounting standards and may confirm the orientation taken by the IASB to include creditors within the main targets of financial information. Bankers may be investors as the others. Other possible motivations for entities to opt for IFRS remain: specific

shareholders may require these standards, as well as the management, for contracting reasons. These could be analysed through further studies.

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Tables

Table 1: Observations by country

This table contains the number of year-firm observations by country and by accounting practice, over the 2005-2018 period.

Country	Local	IFRS	Total
Austria	707	160	867
Belgium	2,362	154	2,516
Croatia	9	0	9
Danemark	894	10	904
Finland	3,128	1	3,129
France	510	521	1,031
Germany	8,63	715	9,345
Greece	308	260	568
Hungary	153	0	153
Ireland	963	95	1,058
Italy	7,649	754	8,403
Latvia	230	18	248
Lituania	194	0	194
Luxembourg	49	42	91
Malta	123	15	138
Netherlands	4,634	5	4,639
Poland	738	59	797
Portugal	13	973	986
Romania	2	3	5
Spain	7,442	25	7,467
Sweden	7,561	2	7,563
United Kingdom	19,548	983	20,531
Total	65,847	4,795	70,642

Table 2: Descriptive Statistics

This table contains descriptive statistics for our dependent variables Debt/Asset, our Accounting Practice variable (IFRS) and our control variables related to firm and country characteristics. First column displays the summary statistics for our full sample; columns (2) and (3) display the summary statistics for respectively firms which are in Local GAAP and firms in IFRS. Our last column displays the mean test by accounting practice with * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

	Full Sample		Mean difference test		
	Mean	Std. Dev.	Local	IFRS	Difference
Accounting Variable					
IFRS	0.068	0.252	0	1	
Dependent Variable					
Debt / Asset	0.199	0.313	0.196	0.248	-0.053***
Log(Debt)	8.612	2.830	8.510	10.012	-1.502***
Control Variable					
Firm Characteristics					
ROA	0.031	0.247	0.032	0.011	0.021***
Tangibility	0.457	0.245	0.452	0.524	-0.072***
Size	11.256	1.578	11.176	12.364	-1.189***
Age	27.817	27.254	28.087	24.114	3.973***
O-score	-3.054	1.667	-3.115	-2.217	-0.898***
Sales Growth	0.066	0.331	0.066	0.067	-0.001
BIG4	0.061	0.240	0.059	0.094	-0.035***
Country Characteristics					
Rule of Law	1.487	0.519	1.504	1.252	0.252***
Civil Law	0.694	0.461	0.688	0.775	-0.086***
Information Index	7.068	1.073	7.064	7.127	-0.063***
Credit Bureau Coverage (CBC)	78.462	37.014	79.657	62.047	17.610***
Credit Registry Coverage (CRC)	18.497	30.292	17.199	36.326	-19.127***
Observations	70,642		65,847	4,795	

Table 3: Correlation matrix

	IFRS	Debt / Asset	Log(Debt)	L.ROA	L.Tangibility	L.Size	L.Age	L.O-score	Sales Growth	BIG4	Rule of Law	Civil Law	Information Index	CBC
IFRS	1.000													
Debt / Asset	0.042***	1.000												
Log(Debt)	0.133***	0.389***	1.000											
L.ROA	-0.018***	-0.115***	-0.039***	1.000										
L.Tangibility	0.073***	0.243***	0.318***	-0.063***	1.000									
L.Size	0.191***	0.056***	0.583***	-0.011***	0.196***	1.000								
L.Age	-0.037***	-0.095***	0.027***	0.003	-0.000	0.113***	1.000							
L.O-score	0.137***	0.327***	0.406***	-0.139***	0.131***	0.362***	-0.104***	1.000						
Sales Growth	0.001	0.010***	0.030***	-0.006	0.005	-0.027***	-0.036***	-0.003	1.000					
BIG4	0.036***	-0.001	0.118***	0.002	0.047***	0.252***	-0.028***	0.105***	0.011***	1.000				
Rule of Law	-0.122***	0.082***	-0.051***	0.033***	0.074***	-0.141***	-0.031***	-0.084***	0.048***	0.137***	1.000			
Civil Law	0.047***	-0.057***	0.277***	-0.009**	-0.035***	0.427***	0.121***	0.131***	-0.041***	0.168***	-0.306***	1.000		
Information Index	0.015***	0.013***	-0.177***	0.004	-0.003	-0.284***	0.055***	-0.098***	-0.008**	-0.373***	-0.076***	-0.545***	1.000	
CBC	-0.120***	0.016***	-0.057***	0.015***	-0.015***	-0.074***	0.027***	0.056***	0.013***	-0.033***	0.132***	-0.386***	0.398***	1.000
CRC	0.159***	-0.028***	0.055***	-0.031***	-0.031***	0.089***	-0.039***	-0.005	-0.026***	-0.100***	-0.508***	0.308***	-0.254***	-0.690***

Table 4: Main estimations

These regressions show the impact of the accounting practice IFRS on the quantity of Private Debt using Debt/Asset. We control for firm characteristics (lagged values) and country characteristics. Model (1) is our main estimation, controlling for year and firm fixed-effect. Models (2) to (10) correspond to sensitivity analysis: in model (2) standard errors are clustered by country, in models (3) to (10) we control for various fixed-effect: country, year and/or industry. The regressions are robust to heteroscedasticity. * p < 0.10, ** p < 0.05, and *** p < 0.01 (standard errors are indicated in brackets).

	Main estimation	Sensitivity analysis								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Debt / Asset	Debt / Asset	Debt / Asset	Debt / Asset	Debt / Asset	Debt / Asset	Debt / Asset	Debt / Asset	Debt / Asset	Debt / Asset
IFRS	0.046***	0.046***	0.031***	0.032***	0.033***	0.030***	0.034***	0.033***	0.030***	0.029***
	(0.009)	(0.012)	(0.006)	(0.006)	(0.007)	(0.006)	(0.007)	(0.007)	(0.006)	(0.007)
L.ROA	-0.034***	-0.034	-0.039***	-0.039***	-0.040***	-0.039***	-0.040***	-0.040***	-0.039***	-0.040***
	(0.003)	(0.040)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
L.Tangibility	0.088***	0.088***	0.209***	0.209***	0.206***	0.206***	0.201***	0.205***	0.206***	0.201***
	(0.011)	(0.020)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)
L.Size	-0.024***	-0.024*	-0.009***	-0.009***	-0.008***	-0.011***	-0.008***	-0.006***	-0.010***	-0.009***
	(0.004)	(0.012)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)
L.Age	-0.003***	-0.003**	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
L.O-score	0.025***	0.025***	0.041***	0.041***	0.042***	0.041***	0.042***	0.042***	0.041***	0.041***
	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Sales Growth	-0.005**	-0.005	-0.004**	-0.005**	-0.004**	-0.005**	-0.005**	-0.005**	-0.005**	-0.005**
	(0.002)	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Rule of Law	-0.009	-0.009	0.041***	0.041***	0.004	0.036***	-0.016	0.314	0.035***	-1.868
	(0.010)	(0.011)	(0.004)	(0.004)	(0.009)	(0.004)	(0.011)	(0.336)	(0.004)	(10.392)
Civil Law			-0.011*	-0.014**	0.327*	-0.023***	0.357*	-0.292	-0.026***	-4.466
			(0.006)	(0.006)	(0.188)	(0.006)	(0.188)	(0.607)	(0.007)	(22.781)
Information Index			0.011***	0.011***	0.128***	0.009***	0.123***	0.084	0.009***	-1.361
			(0.002)	(0.002)	(0.009)	(0.002)	(0.009)	(0.073)	(0.003)	(6.745)
Firm FE	Yes	Yes								
Year FE	Yes	Yes		Yes			Yes			
Country FE					Yes		Yes			
Industry FE						Yes	Yes			
Country x Year FE								Yes		
Industry x Year FE									Yes	
Industry x Country x Year FE										Yes
Cluster by country		Yes								
Constant	0.583***	0.583***	0.217***	0.222***	-0.653***	0.228***	-0.637***	-0.450	0.252***	14.323
	(0.041)	(0.120)	(0.029)	(0.030)	(0.199)	(0.035)	(0.200)	(0.580)	(0.089)	(70.979)
R^2	0.063	0.063	0.166	0.166	0.177	0.170	0.181	0.178	0.171	0.200
N	70,642	70,642	70,642	70,642	70,642	70,642	70,642	70,642	70,642	70,642

Table 5: Regressions with Informational Environment Interaction

These regressions show the impact of the accounting practice $IFRS_{t,i}$ on the $Debt/Asset_{t,i}$ ratio. We control for firm lag characteristics and country characteristics. We add interaction variables to each of our informational characteristics to better understand the specific impact of IFRS according to Credit Bureau Coverage index (column 1) and Credit Registry Coverage index (column 2). Models control for year and country fixed-effects. The regressions are robust to heteroscedasticity. * p < 0.10, ** p < 0.05, and *** p < 0.01 (standard errors are indicated in brackets).

	(1) Debt / Asset	(2) Debt / Asset
IFRS	0.035*	0.045***
	(0.020)	(0.008)
Credit Bureau Coverage (CBC)	-0.005***	
	(0.000)	
IFRS x CBC	-0.000	
	(0.000)	
Credit Registry Coverage (CRC)		0.115***
		(0.009)
IFRS x CRC		-0.001***
		(0.000)
L.ROA	-0.040***	-0.040***
	(0.003)	(0.003)
L.Tangibility	0.205***	0.205***
	(0.007)	(0.007)
L.Size	-0.007***	-0.007***
	(0.002)	(0.002)
L.Age	-0.001***	-0.001***
	(0.000)	(0.000)
L.O-score	0.042***	0.042***
	(0.001)	(0.001)
Sales Growth	-0.005**	-0.005**
	(0.002)	(0.002)
Rule of Law	-0.016	-0.016
	(0.011)	(0.011)
Civil Law	0.336*	2.205***
	(0.188)	(0.243)
Year FE	Yes	Yes
Country FE	Yes	Yes
Constant	0.549***	-1.854***
	(0.189)	(0.246)
R^2	0.177	0.177
N	70,642	70,642

Table 6: Regressions with Legal Environment Interaction

These regressions show the impact of the accounting practice $IFRS_{t,i}$ on the $Debt/Asset_{t,i}$ ratio. We control for firm lag characteristics and country characteristics. We add interaction variables to each of our legal characteristics to better understand the specific impact of IFRS according to Rule of Law index (2) and Civil Law countries (2). Models control for year and country fixed-effects. The regressions are robust to heteroscedasticity. * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$ (standard errors are indicated in brackets).

	(1) Debt / Asset	(2) Debt / Asset
IFRS	0.030*	0.062***
	(0.017)	(0.010)
Rule of Law	-0.016	-0.017
	(0.011)	(0.011)
IFRS x Rule of Law	0.003	
	(0.011)	
Civil Law	0.354*	0.375**
	(0.188)	(0.188)
IFRS x Civil Law		-0.053***
		(0.014)
L.ROA	-0.040***	-0.040***
	(0.003)	(0.003)
L.Tangibility	0.205***	0.206***
	(0.007)	(0.007)
L.Size	-0.007***	-0.007***
	(0.002)	(0.002)
L.Age	-0.001***	-0.001***
	(0.000)	(0.000)
L.O-score	0.042***	0.042***
	(0.001)	(0.001)
Sales Growth	-0.005**	-0.005**
	(0.002)	(0.002)
Information Index	0.127***	0.130***
	(0.010)	(0.010)
Year FE	Yes	Yes
Country FE	Yes	Yes
Constant	-0.638***	-0.673***
	(0.199)	(0.199)
R^2	0.177	0.178
N	70,642	70,642

Table 7: Regression with Firm Characteristics Interactions

These regressions show the impact of the accounting practice $IFRS_{t,i}$ on the $Debt/Asset_{t,i}$ ratio. We control for firm lag characteristics and country characteristics. We add interaction variables to each of our firm characteristics to better understand the specific impact of IFRS according to lag values of Tangibility (1), Size (2), firm's age (3) and O-Score (4). Models control for year and firm fixed-effects. The regressions are robust to heteroscedasticity. * $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$ (standard errors are indicated in brackets).

	(1)	(2)	(3)	(4)
	Debt / Asset	Debt / Asset	Debt / Asset	Debt / Asset
IFRS	0.089***	0.300***	0.050***	0.059***
	(0.018)	(0.064)	(0.012)	(0.012)
L.ROA	-0.034***	-0.034***	-0.034***	-0.034***
	(0.003)	(0.003)	(0.003)	(0.003)
L.Tangibility	0.094***	0.088***	0.088***	0.088***
	(0.011)	(0.011)	(0.011)	(0.011)
IFRS x L.Tangibility	-0.079***			
	(0.028)			
L.Size	-0.023***	-0.022***	-0.024***	-0.023***
	(0.004)	(0.004)	(0.004)	(0.004)
IFRS x L.Size		-0.020***		
		(0.005)		
L.Age	-0.003***	-0.003***	-0.003***	-0.003***
	(0.000)	(0.000)	(0.000)	(0.000)
IFRS x L.Age			-0.000	
			(0.000)	
L.O-score	0.025***	0.025***	0.025***	0.024***
	(0.001)	(0.001)	(0.001)	(0.001)
IFRS x L.O-score				0.007*
				(0.004)
Sales Growth	-0.006**	-0.005**	-0.005**	-0.005**
	(0.002)	(0.002)	(0.002)	(0.002)
Rule of Law	-0.009	-0.008	-0.009	-0.009
	(0.010)	(0.010)	(0.010)	(0.010)
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Constant	0.580***	0.568***	0.583***	0.581***
	(0.041)	(0.041)	(0.041)	(0.041)
R^2	0.063	0.063	0.063	0.063
N	70,642	70,642	70,642	70,642

Table 8: Robustness Tests – Alternative measure of Debt Issue

These regressions show the impact of the accounting practice IFRS on the quantity of Private Debt using an alternative measure Log(Debt). We control for firm characteristics (lagged values) and country characteristics. Model (1) is our main estimation, controlling for firm and year fixed-effect. Models (2) to (10) correspond to sensitivity analysis: in model (2) standard errors are clustered by country, in models (3) to (10) we control for various fixed-effect: country, year and/or industry. The regressions are robust to heteroscedasticity. * p < 0.10, ** p < 0.05, and *** p < 0.01 (standard errors are indicated in brackets).

	Main estimation	Sensitivity analysis								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Log(Debt)	Log(Debt)	Log(Debt)	Log(Debt)	Log(Debt)	Log(Debt)	Log(Debt)	Log(Debt)	Log(Debt)	Log(Debt)
IFRS	0.445***	0.445**	0.259***	0.282***	0.357***	0.259***	0.373***	0.372***	0.267***	0.324***
	(0.083)	(0.174)	(0.054)	(0.054)	(0.060)	(0.054)	(0.059)	(0.059)	(0.053)	(0.060)
L.ROA	-0.000	-0.000	0.048*	0.043	0.045	0.047*	0.038	0.041	0.043	0.035
	(0.031)	(0.025)	(0.029)	(0.029)	(0.028)	(0.029)	(0.028)	(0.028)	(0.029)	(0.029)
L.Tangibility	1.554***	1.554***	2.375***	2.373***	2.357***	2.432***	2.388***	2.344***	2.431***	2.434***
	(0.101)	(0.206)	(0.060)	(0.060)	(0.060)	(0.063)	(0.063)	(0.059)	(0.063)	(0.062)
L.Size	0.845***	0.845***	0.758***	0.779***	0.774***	0.753***	0.793***	0.800***	0.772***	0.792***
	(0.031)	(0.070)	(0.012)	(0.012)	(0.013)	(0.012)	(0.013)	(0.013)	(0.012)	(0.013)
L.Age	-0.081***	-0.081***	-0.005***	-0.004***	-0.006***	-0.005***	-0.003***	-0.004***	-0.003***	-0.003***
	(0.003)	(0.013)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
L.O-score	0.162***	0.162***	0.281***	0.274***	0.289***	0.278***	0.281***	0.288***	0.273***	0.289***
	(0.011)	(0.011)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Sales Growth	0.309***	0.309*	0.312***	0.300***	0.314***	0.311***	0.300***	0.279***	0.297***	0.264***
	(0.020)	(0.153)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.020)	(0.019)	(0.020)
Rule of Law	-0.021	-0.021	0.236***	0.211***	0.257***	0.234***	-0.102	3.656	0.200***	-9.087
	(0.085)	(0.202)	(0.035)	(0.036)	(0.081)	(0.035)	(0.100)	(2.952)	(0.036)	(91.801)
Civil Law			0.864***	0.744***	2.452	0.828***	3.067**	-4.438	0.697***	-20.835
			(0.052)	(0.052)	(1.561)	(0.053)	(1.533)	(5.280)	(0.053)	(201.237)
Information Index			0.186***	0.175***	1.077***	0.188***	1.082***	1.366**	0.175***	-6.881
			(0.021)	(0.020)	(0.079)	(0.021)	(0.077)	(0.635)	(0.020)	(59.576)
Firm FE	Yes	Yes								
Year FE	Yes	Yes		Yes			Yes			
Country FE					Yes		Yes			
Industry FE						Yes	Yes			
Country x Year FE								Yes		
Industry x Year FE									Yes	
Industry x Country x Year FE										Yes
Cluster by country		Yes								
Constant	1.069***	1.069	-2.574***	-2.110***	-2.574***	-2.290***	-8.492***	-10.654**	-2.457***	68.736
	(0.364)	(0.834)	(0.240)	(0.245)	(0.240)	(0.292)	(1.629)	(5.008)	(0.767)	(627.000)
R^2	0.134	0.134	0.425	0.423	0.425	0.428	0.434	0.435	0.427	0.459
N	70,642	70,642	70,642	70,642	70,642	70,642	70,642	70,642	70,642	70,642

Table 9: Robustness Tests – Alternative samples

These regressions show the impact of the accounting practice $IFRS_{t,i}$ on the $Debt/Asset_{t,i}$ ratio on alternative samples. These analyses are based on our main estimation, controlling for firm lag characteristics, country characteristics that vary over time and firm and year fixed-effect. The regressions are robust to heteroscedasticity. * p < 0.10, ** p < 0.05, and *** p < 0.01 (standard errors are indicated in brackets).

	(1)	(2)	(3)	(4)	(5)	(6)
	Excl. Croatia	Excl. UK	Excl. Portugal	Excl. Doubt practice	Excl. Invariant practice	Excl. Doubt & Invariant
	Debt / Asset	Debt / Asset	Debt / Asset	Debt / Asset	Debt / Asset	Debt / Asset
IFRS	0.046***	0.025***	0.046***	0.049***	0.046***	0.049***
	(0.009)	(0.010)	(0.009)	(0.011)	(0.009)	(0.011)
L.ROA	-0.034***	-0.007***	-0.034***	-0.294***	-0.034***	-0.295***
	(0.003)	(0.003)	(0.004)	(0.012)	(0.003)	(0.012)
L.Tangibility	0.088***	0.086***	0.087***	0.042**	0.088***	0.042**
	(0.011)	(0.010)	(0.011)	(0.017)	(0.011)	(0.017)
L.Size	-0.024***	-0.013***	-0.023***	-0.036***	-0.024***	-0.036***
	(0.004)	(0.003)	(0.004)	(0.005)	(0.004)	(0.005)
L.Age	-0.003***	-0.002***	-0.003***	-0.002***	-0.003***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
L.O-score	0.025***	0.025***	0.025***	0.014***	0.025***	0.014***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
Sales Growth	-0.005**	-0.001	-0.006**	-0.012***	-0.006**	-0.012***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)
Rule of Law	-0.009	-0.017**	-0.009	-0.004	-0.009	-0.004
	(0.010)	(0.008)	(0.010)	(0.013)	(0.010)	(0.013)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.585***	0.456***	0.585***	0.677***	0.586***	0.682***
	(0.041)	(0.035)	(0.041)	(0.059)	(0.041)	(0.060)
R^2	0.063	0.074	0.063	0.045	0.063	0.044
N	70,633	50,111	69,656	45,157	70,286	44,801

Table 10: Robustness Tests – Self-Selection Bias

These regressions show the impact of the accounting practice $IFRS_{t,i}$ on the $Debt/Asset_{t,i}$ ratio controlling for self-selection bias using the Inverse Mills ratio. Column 1 corresponds to the first stage of our Heckman model, where we model the probability that a firm adopt IFRS standards. Column 2 corresponds to the second stage of our Heckman model where we include in our main estimation the Heckman λ. The regressions are robust to heteroscedasticity. * p < 0.10, ** p < 0.05, and *** p < 0.01 (standard errors are indicated in brackets).

	(1) First Stage IFRS	(2) Second Stage Debt / Asset
ROA	-0.106	
	(0.071)	
Tangibility	0.320***	
	(0.027)	
Size	0.202***	
	(0.005)	
BIG4	0.059**	
	(0.026)	
Civil Law	-0.032*	
	(0.017)	
IFRS		0.041***
		(0.009)
L.ROA		-0.037***
		(0.004)
L.Tangibility		0.059***
		(0.012)
L.Size		-0.060***
		(0.005)
L.Age		-0.003***
		(0.000)
L.O-score		0.026***
		(0.001)
Sales Growth		-0.011***
		(0.002)
Rule of Law		-0.010
		(0.010)
λ		-0.296***
		(0.020)
Year FE		Yes
Firm FE		Yes
Constant	-3.963***	1.616***
	(0.050)	(0.084)
R^2		0.084
Pseudo R^2	0.066	
N	88,949	68,209

Table 11: Robustness Tests - Propensity Score Matching

This table displays result for our propensity score matching analysis. In the analysis, we match our sample based on the year, the ROA, the Tangibility, the Size, the Age, the O-Score, the Sales Growth, the Country, the Rule of Law, the Information Index, the Civil Law and the Industry. * p < 0.10, ** p < 0.05, and *** p < 0.01 (standard errors are indicated in brackets).

	Debt / Asset
Local vs. IFRS	0.012**
	(2.08)
Observations	70,642

Table A1: Variables Definition

Variables	**Definition**
Dependent Variable	
Debt / Asset	Ratio of Long Term Debt divided by Total Asset
Log(Debt)	Natural log of debt (in dollar)
Independent Variable	
Accounting Variable	
IFRS	1 if the firm uses IFRS as accounting standards, 0 (Local GAAP) otherwise
Control Variables	
Firm Characteristics	
ROA	Ratio of net income divided by total assets
Tangibility	Net property, plant, and equipment divided by total assets
Size	Natural log of total assets (in dollar)
Age	Firm age (in year)
O-score	Ohlson's (1980) measure of default risk, computed as O = -1.32 to 0.407 * (natural log of total assets$_t$) + 6.03 * (total liabilities$_t$ / total assets$_t$) - 1.43 * (working capital$_t$ / total assets$_t$) + 0.076 * (current liabilities$_t$ / current assets$_t$) - 1.72 * (1 if total liabilities > total assets and 0 otherwise) - 0.521 * ((net income$_t$ - net income$_{t-1}$) / (|net income$_t$| + |net income$_{t-1}$|))
Sales Growth	The difference between the natural log of sales at time t and t-1
BIG4	1 if the firm has at least one of the Big4 (i.e. KPMG, PwC, Deloitte or EY) in its auditor group, 0 otherwise
Country Characteristics	
Rule of Law	Index that measures the extent to which agents have confidence in and abide by the rules of society. These include perceptions of the incidence of both violent and non-violent crimes, the effectiveness and predictability of the judiciary, and the enforceability of contracts.
Civil Law	1 if the firm is located in a civil law country, 0 (common law) otherwise.
Information Index	The depth of credit information index measures the coverage, scope and accessibility of credit information available through credit reporting service providers such as credit bureaus or credit registries. The index is ranged from 0 to 8. Average value by country between 2008 and 2018.
Credit Bureau Coverage	Number of individuals and firms listed in a credit private bureau's database (expressed as a percentage of the adult population). Average value by country between 2008 and 2018.
Credit Registry Coverage	Number of individuals and firms listed in a credit public registry's database (expressed as a percentage of the adult population). Average value by country between 2008 and 2018.