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Do IFRS support debt issue for European private companies?

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Abstract: This paper studies the impact of International Financial Reporting Standards (IFRS) adoption on debt issue. It uses empirical analysis to investigate whether European privately held firms can raise debt better by reporting their consolidated financial information according to IFRS rather than local accounting practices. Using fixed-effect regressions on 15,965 firms in 22 countries from 2005 to 2018, the authors show that IFRS adoption leads to better private debt issue for non-listed firms, especially if the firms are opaque or are located in common law countries. The results remain the same regardless of specification and are robust to several alternative tests.

JEL codes: G32, M41, M48

Keywords: IFRS, bank debt, non-listed entities

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Introduction

The choice of accounting practice is crucial for firms, because it can affect their business and financing policies. Companies that are expanding their operations across borders may opt for international accounting standards to achieve comparability, whereas companies that issue equity on foreign stock exchanges may opt for local accounting practices to meet listing requirements. El-Gazzar et al. (1999) investigate the objectives of firms that voluntarily adopt International Accounting Standards (IAS); they argue that implementing IAS not only enhances cross-border trade and financing but also provides creditors with a better understanding of foreign firms' credit risks. Their conclusions emphasize the importance of clarifying and harmonizing firms' accounting disclosure policies to increase transparency, decrease opacity, and support firms' activities.

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; they are optional for non-listed firms (Brébisson & Alphonse, 2018). Literature that studies the impact of mandatory IFRS adoption by listed firms highlights significant benefits for firms. It documents positive, significant capital market reactions to the implementation of IFRS and shows a strong influence of enforcement regime (Armstrong et al., 2010; Li, 2010; Byard et al., 2011; Brüggemann et al., 2013; De George et al., 2016).

However, literature remains relatively scarce with regard to 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 were common before becoming compulsory. The authors show an improvement in accounting quality for voluntary or early adopters, that is, entities that anticipate the application of future rules. Moreover, they highlight that firms with close relationships with their lenders have less incentive to adopt more comprehensive sets of rules. In a larger sample of countries, Renders and Gaeremynck (2007) argue that level of investor protection, as well as corporate governance codes, affect firms' decisions to adopt IFRS. They explain that firms located in countries with strong legal and corporate governance frameworks have greater incentives to adopt IFRS, because they face lower marginal costs of being more transparent.

In the majority of EU member states, non-listed companies can opt to produce their consolidated financial statements in IFRS to satisfy either shareholders' or creditors' needs, following the IFRS Conceptual Framework (International Accounting Standards Board [IASB], 2010). In this study, we investigate firms' motivations for deciding to adopt IFRS. On the one hand, these standards may be required by investors, either for valuation purposes in the context of initial public offerings (IPOs) or private-equity issues or for contracting reasons (i.e., to steward the performance of the company). On the other hand, lenders may request these standards for contracting reasons (i.e., to provide debt).

Although literature has studied listed firms' voluntarily anticipation of the mandatory use of IFRS, it is not clear about why non-listed entities might opt for IFRS. Accordingly, we focus on firms' access to debt to explore a possible motivation for non-listed companies to opt for IFRS in their financial reporting. We examine debt ratios of privately held companies located in Europe from 2005 to 2018. Using a fixed-effect regression on panel data, we show that levels of debt weight in capital structures increase when firms use IFRS instead of local generally accepted accounting principles (GAAP). The results suggest that IFRS facilitate credit access for non-listed firms by reducing opacity; IFRS thus can facilitate debt access, especially for opaque firms or firms in weak informational environments. Our results are robust to different specifications, as well as to the use of matching methodology.

This article contributes to existing literature on the impact of IFRS adoption on firms' access to funds. In addition to the large amount of literature dedicated to the impact of IFRS adoption on capital markets, there is a growing stream of literature that seeks to understand the standards' impacts on the credit market. Florou and Kosi (2015) study whether IFRS facilitate debt access to listed entities; they find that such entities are more likely to issue public debt than private debt. De Lima et al. (2018) focus on the credit market in Brazil, where IFRS became mandatory; they conclude that firms that adopt IFRS have better access to debt only if they seriously and honestly implement the standards. By studying the credit market rather than the capital market, we add to the debate on the general impact of IFRS adoption; we acknowledge that creditors' needs and uses of financial information may differ from those of shareholders. Moreover, debt financing is one of the major sources of funds for companies. Ball et al. (2008) claim that the selection of accounting standards is influenced more by credit market expectations than capital market expectations.

Our analysis also adds to the debate on firms' motivations to change their accounting standards. Most accounting research 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 (Florou et al., 2017; Wu & Zhang, 2014). We complement these insights by considering the case of private companies in Europe as a unique setting of non-mandated firms that opt for IFRS. These firms may be less constrained in terms of communication, because they have the freedom to publish their financial information in either local or international sets of accounts. By explaining why these privately held entities opt for IFRS, we can improve understanding of the role of accounting standards and contribute to the debate on the objectives of financial information—that is, valuation or stewardship—as well as the status of international standards related to both of these objectives.

Finally, by determining which kind of private entities opt for IFRS, we add to regulatory debates at both the European and national levels. After the adoption of IFRS by listed companies, the EU debated whether to adopt the IFRS for small- and medium-sized enterprises (SMEs) for other entities. The EU finally adopted the 34th Directive in 2013, establishing a list of common accounting principles to support the harmonization of local rules (André, 2017). However, non-listed companies can still choose whether to adopt the full IFRS set of standards. Therefore, the reasons for their choices must be clarified to provide accounting authorities at both at the European and national levels with a clear framework to design future accounting regulations.

The remainder of this article is organized as follows: Section 1 reviews literature; Section 2 presents our data and methodology; Section 3 develops our results; and Section 4 describes our robustness tests.

1. Literature Review

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

In Europe, Regulation (EC) No 1606/2002 mandates listed groups to publish their consolidated accounts in IFRS. Each member state is free to expand the use of IFRS to other types of entities. Multiple countries have given private groups the option to choose between local GAAP and IFRS for their consolidated reporting. This reform is part of a 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 improved reporting quality and enhanced comparability between issuers, in particular for cross-country operations.[4] Beneish et al. (2015) show that IFRS adoption improves the quality of financial reporting more than the comparability of equity and bond markets. However, the quality of financial reporting relies on managers' reporting incentives and accounting enforcement, which may differ from one country to another (Christensen et al., 2007; Barth et al., 2008; Fox et al., 2013). For example, Jeanjean and Stolowy (2008) show that the pervasiveness of earnings management has not declined in Australia and the United Kingdom; in France, it actually increased during the first year of IFRS adoption. Although 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 conclude that IFRS is an alternative when legal environments are weak. De Lima et al. (2018) analyze the case of Brazil; they emphasize that the impact of IFRS is all the more important there, because the country suffers low levels of law enforcement and credit protection. Overall, literature emphasizes the role of individual and institutional incentives in enhancing reporting quality (Ball et al., 2000).

Furthermore, previous studies document positive and significant capital market reactions to the implementation of IFRS and find that enforcement regimes have a strong influence (Li, 2010; Brüggemann et al., 2013). Armstrong et al. (2010) run an event study of European stock exchanges between 2002 and 2005; they find a significant and positive market reaction to events that encourage the implementation of IFRS. However, they mitigate their conclusions by highlighting a negative market reaction for firms located in countries with low investor protection. This result reflects investors' concerns about the enforcement of IFRS. Byard et al. (2011) investigate more precisely the effect of IFRS use on analysts' forecasts; they show evidence of a decrease in forecasting errors following the adoption of IFRS, especially if firms are located in countries with strong enforcement regimes. Bilinski et al. (2013) confirm these 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. Thus, empirical studies indicate positive relationships among IFRS

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

implementation, performance and efficiency of capital markets, and growth in foreign investment (Barth et al., 2014; Beuselinck et al., 2009).

Growing literature also investigates IFRS consequences for debt markets.[5] Naranjo et al. (2014) find that, for listed companies, IFRS mandatory adoption is associated with better access to public sources of funds, but Florou and Kosi (2015) add that it is not associated with private debt markets or more competitive costs of debt. In line with these conclusions, Kim et al. (2011) confirm a positive relationship between IFRS use and loan amounts and a negative relationship with interest rate levels. Accordingly, borrowers who adopt IFRS enhance their abilities to raise debt at lower costs. In contrast, Chen et al. (2015) provide evidence of an increase in syndicated loan costs and a decrease in maturity for borrowers using IFRS, depending 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; they conclude that firms that adopt IFRS have better access to debt only if they seriously and honestly implement the new accounting standards. According to the authors, the impact of IFRS is even more important when countries have weak legal enforcement or lack credit protection. Therefore, accounting standards act as a counterweight, helping issuers signal themselves (Spence, 1973).

1.2. IFRS non-mandatory adoption: motivation and impact

Beyond the mandatory adoption of IFRS, which has been widely studied, non-listed groups' reasons for choosing international standards remain unclear. Literature provides insights on 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 on Germany, where from 1998 to 2005—when international standards became mandatory—listed firms were given a choice to adopt IFRS. The authors find there was a significant improvement in reporting quality, that is, lower earnings management, better loss recognition, and increased value relevance for voluntary adopters. Bassemir (2018) explores the reasons that German private firms opted for IFRS, starting when IFRS were not yet mandatory for listed firms and even before European countries voted for IFRS. His results suggest that opting firms have important

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

financing needs and international activities. Bassemir and Novotny-Farkas (2018) use a similar sample of German private firms to identify four main reasons to adopt IFRS: gaining access to public equity, gaining 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, whereas in the last category—which relates to firms' reputations—companies choose IFRS for comparability (i.e., contracting purposes). A possible interpretation of these results is that a major reason to opt for IFRS is to prepare for future mandatory applications following equity or bond IPOs. Private equity sponsors also can influence private firms to adopt IFRS as a way to prepare firms for future IPOs or mergers with listed firms. Finally, firms may simply opt to adopt future mandatory rules in advance.

The underlying hypothesis about voluntary IFRS adoption by listed firms is that the standards signal high quality. Listed entities communicate to a large number of investors who then value their investments and compare them with the values of other issuers. Chan et al. (2013) highlight significant improvement in credit ratings after the adoption of IFRS. The signaling hypothesis (Spence, 1973) is critical here, because 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). Accordingly, Chen et al. (2013) emphasize the importance of accounting information quality with regard to the financing decisions of firms; they argue that companies with low accounting credibility, proxied by the number of accounting restatements, rely more on debt than equity as a result of higher information asymmetry problems. Asymmetry is less of an issue for debtholders who can obtain the necessary information through private channels. However, private firms sometimes seek new sources of funds to develop specific projects. This quest could lead them to prepare IPOs or introduce new investors from private equity (PE) or venture capitalist (VC) sectors. Alternatively, they could ask for new bank loans. However, historical banking partners may not be able to fully fund major investment projects; they may have to build syndicated loans, such that private firms borrow from syndicates (i.e., group of banks) with new partners who require higher levels of financial information quality. Therefore, when private groups raise funds from new sources, they may change their accounting standards to improve their communication with new financial partners—which leads back to signaling theory.

Moreover, the international syndicated loan market amounts to one-third of international financing and includes commercial papers, bonds, and stocks (Gadanecz, 2004). Gaining access to this international debt market may motivate private companies to adopt IFRS. Balsmeier and Vanhaverbeke (2018) observe that private firms that opt for IFRS are more likely to attract debt from foreign banks, inducing the increased comparability of IFRS information. Moreover, Hope et al. (2011) show that firms with greater financial reporting credibility have better access to external finance, especially when the firms are located in countries with low levels of creditor protection. Therefore, accounting standards could help firms reduce their opacity, particularly when their legal or informational environments are not helpful; such assistance is especially important for non-listed or SMEs (Haselmann & Wachtel, 2010; Jappelli & Pagano, 2002; Jappelli et al., 2005). Belletante and Levratto (1995) thus identify a communication issue related to SMEs that are reluctant to disclose financial information.

1.3. Contribution to literature

Although IFRS can be used to reduce firms' opacity, it is not clear which actors private entities should signal to, or if they should signal at all. Are they justified in opting for IFRS? Nobes (2010) shows that using findings based on listed companies to build hypotheses on private firms' behavior is difficult, because there are major differences between their shareholder structures. Moreover, it is not clear whether opting for IFRS is better in environments with strong legal enforcement and assured reporting quality, or in environments with weak legal enforcement and reporting quality.

We seek to contribute to the debate about the reasons that firms choose IFRS even when they are not forced to do so. More precisely, we investigate whether publishing information using IFRS provides private groups with better access to debt. By studying the debt market instead of the capital market, we add to the debate on the general impact of IFRS adoption, because creditors and shareholders may differ in their needs and uses of financial information. Moreover, debt financing is one of the major sources of funds for companies; as noted, Ball et al. (2008) claim that the selection of accounting standards is influenced more by credit market expectations than capital market expectations.

2. Data and Methodology

2.1. Data

We use the Orbis database for our empirical analysis. Our initial sample is composed of active European non-listed or delisted firms since 2005 that produce consolidated accounts. To allow comparability, we retain only large firms, as defined by Orbis; we require firms to pass one or more of the following thresholds: (1) total assets equal to or more than EUR 20 million, (2) turnover equal to or more than EUR 10 million, and (3) number of employees equal to or more than 150. We retain entities that passed one of the thresholds at least twice over the 2005 to 2018 period.

Because we focus on non-mandatory IFRS adoption, we exclude groups from member states in which IFRS were not allowed for non-listed companies and countries in which IFRS were mandatory for consolidated accounts of non-listed groups (i.e., Cyprus, Bulgaria, Slovakia and Czech Republic). The only country in which IFRS were not allowed in consolidated accounts was Croatia, and for only a part of non-listed companies. Because we could not control whether the Croatian firms were allowed to use IFRS, we kept these firms.[6]

We remove all firms in which the last owners were private equity or venture capitalist actors, hedge funds, pension funds, or trustees. This step allows us to exclude the potential influence of specific shareholders on choice of standards and concentrate on links with debt. Finally, we remove finance, insurance, real estate (FIRE) and public or governmental entities because of their specificities; we also remove all observations that are missing information over the 2005 to 2018 period.

Using Orbis, we collect basic financial information on firms' consolidated balance sheets and income statements. The database also provides the standards used by the firms (i.e., IFRS or local GAAP). Our final sample consists of 15,591 firms from 2005 to 2018, for a total number of 70,642 observations dispatched over 22 European countries (see Table 1 for the country distribution of our sample).

[6] In a robustness test, we excluded Croatian firms, and our results remained 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. We build our database using panel data and run the following model using the 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 accounts are in local GAAP. These data are available directly from the Orbis database (for descriptions of all variables, see Table A1). $Debt_{i,t}$ 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 characteristics such as size (through total assets), age, profitability (using return on assets [ROA]), and growth through sales. Because opacity is an important determinant of non-listed firms' access to credit (Berger and Udell, 1998), we control for firms' opacity using tangibility. For information about risks, we use firms' O-Scores (Ohlson, 1980), which measure distress risk; the higher the score, the higher the risk. We take all control variables with one lag to avoid endogeneity.

We also control for country characteristics, because literature shows the impacts of legal procedures (Wu & Zhang, 2014) and informational environment (Jappelli and Pagano, 2002) on use of debt and, potentially, on IFRS adoption. We control for the legal system with a dummy equal to 1 if a firm's country uses *Civil Law*, and 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 country measures come from the WorldBank Doing Business 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). That is, there are no theoretical frameworks with regard to the use of fixed-effect and clustered standard errors. Thus, because we use panel data, we decide to control for time and firm fixed-effects 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, according to 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. Only 6.5% of our sample use IFRS (4,795 observations). The debt variable shows that companies have, on average, about 20% private debt in their capital structures. Notably, on average, companies that adopt IFRS have 5.3% more debt in their capital structures than companies that use local GAAP (they have, respectively, 24.8% and 19.6% of debt on asset). This first result seems in line with our prediction that IFRS allow firms to have access to more debt.

Table 2 also highlights significant differences for all control variables, except sales growth, when we compare firms using IFRS to firms using local accounting practices. Our findings seem in line with previous literature (Affes & Callimaci, 2007; André et al., 2012; Erkens, 2016): Firms that adopt IFRS standards are bigger, riskier, less performant, and more tangible than firms that use local GAAP; they also are more likely to have a "BIG 4" auditor on their audit team. The only surprising result relates to age: We expected older firms to be more likely to adopt IFRS more than younger firms, but our univariate analysis shows the opposite result, which may be related to risk (i.e., perhaps younger firms use IFRS to send a signal).

3. Results

3.1. Main results

Table 4 presents the results of our main estimation model. Our objective is to determine whether firms that adopt IFRS voluntarily issue more debt than other firms. As explained previously, because there are no clear rules for the use of fixed-effect or clusters in models, we use both to test the sensitivity of our results. Model (1), the main estimation, includes firm and year fixed-effects. Model (2) replicates the main estimation with standard errors clustered by country.[7] In Models (3)–(10), the estimates include different combinations of years, countries, and industry

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

fixed-effects. Across specifications, IFRS is positively and significantly associated with *Debt/Asset* ratio: Firms that use IFRS tend to increase the shares of debt in their capital structures significantly. Firms that use IFRS have, on average, 2.9% to 4.6% more debt than firms that use local GAAP. In line with de Lima et al. (2018), we argue that the adoption of international accounting standards supports firms' access to the debt market.

With regard to the control variables, the models show that *Debt/Asset* ratio is negatively associated with performance. Firms with low performance may have low access to debt. In line with pecking order theory (Frank and Goyal 2003), *Tangibility* has a positive and significant impact on the *Debt/Asset* ratio, such that it is negatively correlated with information asymmetry. Surprisingly, size and age have negative and significant relationships with *Debt/Asset* ratio. We suggest that bigger or older firms may have a relatively lower propensity to borrow because of their equity levels. Furthermore, compared with smaller companies, larger and older companies may have several alternative sources of funds and be less dependent on debt. The O-Score is positively associated with the *Debt/Asset* ratio, so firms that present higher risks appear more leveraged. Finally, *Sales Growth* is negatively correlated with *Debt/Asset* ratio; more leveraged structures are 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, to understand how the link between IFRS adoption and debt access works.

3.2.1. Informational and legal interaction

We first analyze the country informational environment. In the main estimation, we use *Information Index* to control for the global informational environment. This measure includes not only the presence of a credit bureau/registry but also its availability and accessibility. By focusing on level of information asymmetry in the market, we seek to test our hypothesis of opacity. In environments with low information asymmetry, the benefit of adopting IFRS can be lower than in countries with high information asymmetry. Jappelli and Pagano (2002) prove that the larger the number of credit bureaus or credit registries, the lower the information asymmetry on the credit market; credit bureaus or registries help reduce information asymmetry between borrowers and lenders. Accordingly, we ask whether firms in countries with numerous credit bureaus or registries benefit less than other firms from IFRS adoption. To answer this

question, we interact our IFRS variable with *Credit Bureau Coverage* (Table 5, Column 1) and *Credit Registry Coverage* (Column 2); the IFRS variable remains positive and significant, and only the interaction of *IFRS × Credit Registry Coverage* is negative and significant. That is, the higher the percentage of companies registered in public registries, the less IFRS improve debt access. This finding is in line with our intuition that IFRS and the information environment play the same role in reducing information asymmetry. Our results are valid only for public registries (*Registry*) and not for private registries (*Bureau*), which could be interpreted as a question of access to information (i.e., most public registries are cheaper to access than private bureaus).

Next, Wu and Zhang (2014) and Karahan et al. (2016) explain that countries under common law, such as the United Kingdom, have stronger investor protections and higher disclosure levels for financial information than countries under civil law. Accordingly, 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). Regardless of the specification, our IFRS measure is always positive and significant. With regard to our interaction variable, only *IFRS × Civil Law* is negative and significant. Therefore, when firms adopt IFRS and are in countries with civil law (e.g., France, Belgium), their access to credit improves (i.e., the sum of both coefficients remains positive and significant), which it does to a lesser extent when they are in common law countries. Arguably, in civil law countries, the distance between accounting practices—that is, between local accounting rules and IFRS—may be greater (Ding et al., 2005; Ding et al., 2007).

3.2.2. Interactions of firm characteristics

In this section, we interact our IFRS variable with several firm characteristics to determine whether firm characteristics can drive the benefits of using IFRS. Although IFRS allow firms to reduce their opacity, some firms—such as those that are not naturally opaque—will have less advantage than others in using the standards. Table 7 shows the interactions of our IFRS variable with various proxies of firm opacity: tangibility (high tangibility leads to low opacity, Column 1), size (small firms are more opaque than large firms, Column 2), age (young firms are more opaque than older firms, Column 3), and risk (higher opacity leads to higher risk, Column 4). With regard to tangibility (Column 1), the interaction of *IFRS × Tangibility* is negative and significant. That is, highly tangible firms (i.e., low opacity) that use IFRS have lower debt. This result confirms our intuition that IFRS are being used to reduce opacity,

because firms that are tangible, and therefore not opaque, benefit less than opaque firms from using IFRS.

With regard to size (Column 2), the larger the size of firms that adopt IFRS, the smaller their benefits in terms of access to debt. Being small may decrease the number of potential sources of funds, mainly as a result of opacity. Therefore, small companies have a greater incentive than large companies to use IFRS, because they know they will benefit more. Accordingly, small firms may have the same incentive as high-risk firms (previously mentioned) to use IFRS to attract new lenders—and to benefit from better access to the debt market. In contrast, there may be no significant change in the capital structures of large firms even if they borrow more. With regard to age (Column 3), the interaction term is not significant.

Finally, with regard to risk (Column 4), we find that the higher the risk supported by firms that adopt IFRS, the greater their access to debt. We can analyze this result through signaling theory: Firms with higher O-Scores represent higher levels of risk and may suffer from lack of funding sources. Therefore, despite the burden and complexity of changing their accounting standards, these high-risk firms may have an incentive to adopt IFRS to become more transparent and have better access to the debt market. Thus, except for age, all our variables are in line with our initial intuition: The most opaque firms benefit more than the least opaque firms from the use of IFRS in their access to debt.

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 previous methodology, controlling for the same variables and testing several potential fixed-effects and clusters. Table 8 displays the results for this alternative measure of debt. Regardless of the specification, the coefficient of the IFRS variable is always positive and significant. This finding indicates that firms using IFRS have higher debt values than others, in support of our initial results.

3.3.2. Alternative samples

We are aware that our results also could be driven by our sample and potential biases in the sample. Accordingly, we control for the potential biases using alternative samples (Table 9).

First, as we previously explained, though we know that IFRS are not allowed for a group of non-listed companies in Croatia, we cannot know whether other firms in our sample are allowed or not allowed to adopt the standards. Because we retain these observations in the main estimation, Column 1 displays our results for the sample that excludes Croatian firms; it shows that our results remain the same.

Second, bias could arise from the United Kingdom, which represents approximately one-third of our sample. To verify that our results are not driven by a single country, we run our estimation on a sample that excludes the United Kingdom (Column 2). We observe similar results.

Third, a bias could arise from the quality of the data. André (2017) highlights some potential mistakes in the registration in the Orbis accounting practice variable. He cites the example of Portugal, where the number of IFRS firms seems too high. is too important. To manage this potential quality problem, we first test our estimation on a sample that excludes Portugal (André clearly identifies this country, Column 3). Next, we exclude countries with less than 5% of IFRS firms (we refer to *Doubt Practice*, Column 4). Finally, we use a sample that excludes invariant countries, in which firms use only one set of standards (*Invariant Practice,* Columns 5 and 6, together with *Doubt Practice*). The results remain consistent, no matter which sample we use.

3.3.3. Self-selection bias

As explained by De George et al. (2016) self-selection bias can be an issue in studies of voluntary adoption. For their own reasons, companies might decide not to adopt IFRS, which would bias the results. To control for this potential bias, we follow Leuz and Verrecchia (2000) and use a two-stage Heckmann (1979) estimation approach. In the first step, we use a probit model to estimate the probability that a firm will adopt IFRS; we then compute the inverse Mills ratio[8] and include it in our second step, which corresponds to our main equation.

In the first step, we model the probability that a firm will adopt IFRS using the same model as Leuz and Verrecchia (2000) and Daske (2006). As independent variables, we use the natural logarithm of total assets, tangibility (also referred to by some authors as capital intensity) and

[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.

ROA, as proxies for firm size, financing needs, and performance. Leuz (2003) shows that the first two variables relate positively to the adoption of IFRS, whereas the results on performance are mixed. We also control whether the firm is in a common-law country, where it is easier to adopt IFRS, because there is less distance from local accounting standards. Finally, we control for the presence of a BIG4 auditor on the firm's audit team, because that auditor may support IFRS implementation (André et al., 2012).

Table 10 displays the results for the Heckman estimation. In the first step (Column 1), use of IFRS is positively related to firm size and financing needs (in line with Leuz, 2004); firms in common law countries are more likely than firms in civil law countries to adopt IFRS standards (in confirmation of our first intuition); and IFRS adoption is positively related to the presence of a BIG4 on a firm's audit team. In the second step (Column 2), our IFRS variable remains positive and significant, even after controlling for the inverse Mills ratio. This ratio is negative and significant, confirming that negative selection has occurred. Without this correction, the estimate coefficient of IFRS would have been a 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 could be biased by (unobservable) variables that affect both IFRS and debt access, leading to a bias such as simultaneous causality. For example, firms that know they will have difficulty accessing new debt (e.g., due to their opacity) could decide to adopt IFRS to facilitate debt access. Therefore, our IFRS variable could be endogenous. To solve this problem, we use an instrumental variable (IV) regression, following the methodology of Larcker and Rusticus (2010), who explain that it is important to address the endogeneity problem before implementing the IV regression and to ensure that all tests assess model quality. The authors also note the difficulty of finding a valid instrument.

As an instrument, we use the presence of a BIG 4 auditor on a firm's audit team; both André et al. (2012) and Affes and Callimaci (2007) show that the presence of a BIG4 auditor is linked directly to IFRS adoption. Moreover, in our sample, BIG4 presence is significantly and highly correlated with IFRS adoption but is not linked directly to debt level (i.e., there is no correlation

[9] For a fuller explanation of how to interpret the Mills ratio, see Kai and Prabhala (2007).

between BIG4 and our dependent variable). Thus we use a probit model, because IFRS is a dummy, to 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 determine whether IFRS and *Debt/Asset* are endogenous. If the result of the test is (not) significant, both variables are (not) endogenous, and the best model is IV (ordinary least squares [OLS]) regression (Maddala, 1986). In our case, the *p*-value of the Hausman test is equal to 0.6066, such that our main estimation does not suffer from endogeneity bias caused by omitted variables (Van Tendeloo and Vanstraelen, 2005). Therefore, the best model is 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 firm and country characteristics. However, even if fixed-effects allow us to control for multiple characteristics, because of data limitations we cannot control directly for the characteristics of the project financed with new loans. One solution to this problem of missing data is to apply a propensity-score matching method (Ioannidou and Ongena, 2010).

The aim of this technique is to gather companies that share similar characteristics (e.g., size, industry) and regress the dependent variable (i.e., *Debt/Asset*) on a treatment dummy (i.e., equal to 1 if a firm applies IFRS). Thus the dummy is the only remaining difference between two groups of similar companies, assumed to share the same investment opportunities.

Following the methodology of Shipman et al. (2017) and in line with previous literature (Florou et al., 2017; Florou and Kosi, 2015), we match firms based on all previous variables used in our model—country, sector, size, ROA, tangibility, risk score, sales growth, year, country characteristics (e.g., rule of law), credit bureau coverage, and type of law—to match firms according to common characteristics that explain level of private debt. We use the nearest-neighbour matching method. Table 11 displays the results for the propensity-score matching analysis for the *Debt/Asset* variable. Firms that use IFRS have higher debt-to-asset ratios than firms that use local GAAP.

4. Discussion and Conclusion

Our paper appraises the impact of voluntary adoption of IFRS on debt level. We postulate that IFRS helps firms access debt by reducing their opacity. To test this assertion, we estimate a panel data regression on a sample of 15,965 European private firms between 2005 and 2018. The findings show that IFRS voluntary adoption for non-listed groups is positively associated with debt/asset ratios and that choice of IFRS is all the more beneficial for firms that need to reduce information asymmetry related to country conditions or their own opacity.

Strong informational environments appear to affect the benefits of firms that adopt IFRS: The greater the presence of credit registries in countries, the lower the benefit of using IFRS for debt issue. With regard to legal environment, IFRS adoption tends to be more beneficial in common-law countries than civil-law countries, because the distance between local GAAP and IFRS in the latter is greater and may limit the reduction of information asymmetry.

Moreover, opaque firms may opt for IFRS to signal their quality. In particular, for riskier, smaller, or less tangible firms, the switch to IFRS could serve as a signal; the signal hypothesis may explain the adoption of IFRS by non-mandated firms in Europe. Non-listed companies may have to find new partners that do not have the inside knowledge of main stakeholders; IFRS may help firms reduce their opacity, suggesting that IFRS may be used for contracting purposes. If confirmed, this finding would be relatively new, because international standards have been studied mostly from a 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 also are confirmed by propensity score matching.

Nevertheless, our work has several limitations; at this stage, our debt measures are only proxies for debt access. The debt/asset ratio may show structures of funding. It also could be interpreted as a choice of debt versus equity (i.e., to drive funding). Moreover, these variables are modified merely by the move to standards; though in Europe, many countries have converged their local accounting standards with IFRS, differences remain in terms of rules or practices that may change debt levels and ratios. Finally, in spite of our controls, there are questions about the Orbis database itself, with regard to the variable related to accounting practice (André, 2017).

However, our results are robust and coherent enough to allow us to propose that private entities that choose IFRS voluntarily can improve their access to debt. These results contribute to the

debate on the role of accounting standards and support the IASB's initiative to include creditors within the main targets of financial information; after all, bankers also are investors. Moreover, there are other possible motivations for entities to opt for IFRS: Both managers and specific shareholders may require these standards for contracting reasons. These motivations could be analyzed 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
Lithuania	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	CRC
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***	1.000

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 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, and 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 according to year, ROA, Tangibility, Size, Age, O-Score, Sales Growth, Country, Rule of Law, Information Index, Civil Law, and 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 dollars)
Age	Firm age (in years)
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	Difference between natural log of sales at time t and t-1
BIG4	1 if the firm has at least one of the Big4 auditors (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; includes perceptions of incidence of both violent and non-violent crimes, effectiveness and predictability of the judiciary, and enforceability of contracts
Civil Law	1 if the firm is located in a civil law country, 0 (common law) otherwise
Information Index	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 ranges from 0 to 8; average value is by country between 2008 and 2018.
Credit Bureau Coverage	Number of individuals and firms listed in a credit private bureau's database (expressed as percentage of adult population); average value is 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 is by country between 2008 and 2018.