

International financial reporting standards and private firms' access to bank loans

Benjamin Balsmeier and Steven Vanhaverbeke



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ABSTRACT: Prior research has focused on publicly listed firms when examining the economic consequences of adopting International Financial Reporting Standards (IFRS). This study extends the literature by examining the ability of private firms to attract bank loans through the use of IFRS. Based on firm-level data from 25 countries, we show that private firms that voluntarily use IFRS are associated with a higher propensity to attract debt from foreign banks. We find no such association when examining their relationships with domestic banks. Supplementary analyses show that the results are mainly driven by private firms operating in countries with strong regulatory enforcement. The findings suggest that, conditional on adequate enforcement, the use of IFRS provides useful information for foreign non-relationship banks.

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Contact details:

Benjamin Balsmeier

Technical University Freiberg, Faculty of Economics, Chair for International Management and Corporate Strategy, Schlossplatz 1, 09599 Freiberg, Germany

Tel: +49 3731 39 2081

Email: Benjamin.Balsmeier@bwl.tu-freiberg.de

Steven Vanhaverbeke

KU Leuven, Department of Managerial Economics, Strategy and Innovation

Naamsestraat 69, 3000 Leuven, Belgium

Tel: +32 16 325 735

Email: Steven.Vanhaverbeke@kuleuven.be

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Correspondence address

Steven Vanhaverbeke, KU Leuven, Naamsestraat 69, Leuven 3000, Belgium. Email: Steven.Vanhaverbeke@kuleuven.be

1. Introduction

Prior research has documented various debt market consequences of IFRS adoption by firms listed on public stock exchanges. While voluntary IFRS adoption would seem to be associated with positive effects for the public firms (Florou & Kosi, 2015; Kim, Tsui, & Cheong, 2011), recent research suggests that mandatory IFRS adoption has no positive effects on debt financing and, indeed, may exert a negative impact (Ball, Li, & Shivakumar, 2015; Chen, Chin, Wang, & Yao, 2015; Florou & Kosi, 2015). Compared to the extensive evidence in the literature concerning the effects of IFRS adoption on publicly listed firms, there has been relatively little research exploring the economic consequences of IFRS usage by private firms.

This study examines how the voluntary usage of IFRS by private firms influences their ability to attract debt financing from domestic and foreign banks.

Currently, in 90 percent of the 116 jurisdictions that require publicly listed firms to adopt IFRS, regulators also allow private firms to adopt IFRS (IASB, 2015).¹ Private firms are typically smaller than publicly listed firms and have a rather concentrated ownership structure with different governance, management and compensation structures. These characteristics influence the costs and benefits of using IFRS, which, in turn, influences the incentives to create corresponding accounts. Hence, the use of IFRS by private firms may have a different impact on bank financing compared to effects found for listed firms.

Agency costs from the separation of ownership and control play a minor role for private firms (Fama & Jensen, 1985). This reduces the pressure for transparency from investors (Ball & Shivakumar, 2005; Burgstahler, Hail, & Leuz, 2006). Private firms often respond to the specific needs of their stakeholders through private communication channels (Ball &

¹ While representative data is scarce, other research studies document IFRS usage by private firms in different settings. Bassemir (2012) reports that 11% of private German firms voluntarily adopted IFRS in the period 1998-2009. André, Walton, and Yang (2012) reports a percentage of 3.41% of private UK firms that used IFRS in 2009. 26.6% of large private Portuguese firms used IFRS voluntarily in 2009 (Guerreiro, Rodrigues, & Craig, 2012).

Shivakumar, 2005). In addition, banks frequently have access to detailed private information, which reduces the demand for public financial statements (Chen, Hope, Li, & Wang, 2011).

While the latter arguments suggest that the use of IFRS by private firms has no effect on their ability to attract debt financing, most arguments for positive as well as negative effects of IFRS usage by public firms also apply to private firms. Furthermore, the quality of private firms' financial statements is no less important for non-relationship lenders. Information-based theories show that non-relationship (transactional) banks use their advanced capabilities to process 'hard' information when assessing a borrower's credit quality regardless of whether a company's stock is publicly traded (Berger & Udell, 2006).

Regarding potential positive effects, IFRS usage may increase the quantity and quality of financial information provided to debt holders since IFRS demands the recognition of additional liabilities that are not required by most local accounting standards. Furthermore, the fair value orientation of IFRS promotes swift recognition of good and bad news, which improves the quality of information available to debt holders (Florou & Kosi, 2015). These arguments suggest that IFRS usage facilitates the assessment of a borrower's creditworthiness and, thus, helps firms to attract debt financing.

On the other hand, IFRS usage may have negative influences on debt financing. The greater flexibility inherent in IFRS allows more opportunistic earnings management, which is frequently used by private firms (Burgstahler et al., 2006). Other scholars argue that the emphasis on fair value accounting in IFRS decreases the verifiability and reliability of accounting measures, and this, in turn, reduces a potential lender's perception of credit quality (Ball et al., 2015; Chen et al., 2015). Overall, it seems primarily an empirical question how IFRS usage influences the ability of private firms to attract debt financing.

In the current analysis, we employ large-scale cross-country firm-level data from the European Bank for Reconstruction and Development (EBRD). The data were collected in 25

European and Asian countries during 2004 and 2005. As in other regions of the world, private firms comprise the largest proportion of firms within this region.²

The EBRD dataset has several unique features. First, it contains large-scale random samples of private firms where we can distinguish between private firms that use IFRS and private firms that rely solely on local accounting standards. Normally, this information is not publicly available.³ Second, it provides information on loans received from domestic banks and from foreign banks. Access to foreign banks is particularly relevant for private firms that operate in relatively small domestic financial markets (Berger, Demirgüç-Kunt, Levine, & Haubrich, 2004; Clarke, Cull, & Shirley, 2005). Third, the strength of the enforcement regimes varies significantly across the countries sampled, enabling us to address the role of enforceability of accounting standards.

The econometric analysis reveals that voluntary IFRS users are associated with a greater propensity to receive loans from foreign banks to finance their new fixed investments, whereas no such association between IFRS usage and the propensity to receive loans from a domestic bank exists. This result is consistent with the notion that IFRS-based accounting is helpful for (foreign) non-relationship banks, whereas the marginal increase in information is rather low for (domestic) relationship-oriented banks. We note that all results are robust to controlling for various sources of self-selection that would normally confound empirical analyses, because private firms non-randomly chose to use IFRS. Since the matching techniques employed rely on observable selection criteria, we cannot and do not claim to report causal effects, though.

² Out of the 25 million firms active in the European Union, 10,391 domestic firms are listed on a stock exchange in 2012. Similarly in the US, approximately 4500 domestic firms out of the 28 million are publicly listed (World Bank, 2015b; World Federation of Exchanges, 2015)

³ Other databases that provide accounting data for private firms, such as Amadeus, solely contain data on the statutory financial statements of firms. Moreover, the Amadeus database does not differentiate between local GAAP and IFRS for most countries. Our dataset also includes firms that use IFRS from countries in which IFRS adoption was neither allowed nor required for official purposes. Our selection of countries is comparable to other studies that examine the voluntary adoption of IFRS, such as Cuijpers and Buijink (2005) and Daske, Hail, Leuz, and Verdi (2013). Private firms can either use IFRS to create a single set of financial statements if allowed by national regulators, or for dual reporting and reconsolidation purposes.

Our study makes three principal contributions to the literature. First, we provide large-scale evidence on private firms' IFRS usage and debt financing, complementing the extensive literature on public firms' IFRS usage. Second, in differentiating between debt financing by domestic banks and foreign banks, our study underscores important but formerly neglected differences in the way IFRS usage contributes to private firms' investments. Third, our results support previous findings that enforceability and credibility play an important role in the effectiveness of IFRS usage.

The remainder of the paper proceeds as follows. Section 2 describes the related literature on IFRS adoption. Section 3 introduces the empirical setup. Section 4 outlines our methodological approach and Section 5 presents the results. Section 6 covers robustness tests and the limitations of this study. Section 7 draws our conclusions.

2. Review of the Literature and Hypothesis Development

2.1. Prior Literature on IFRS Adoption and its Effects on Debt Financing

Regulators, standard setters and accounting companies claim that IFRS adoption is effective in providing high quality information that reduce information asymmetries among capital lenders and borrowers. IFRS require more detailed disclosures, enhance the comparability of firms, facilitate better measurement and recognition of additional liabilities, and reduce the scope of earnings management (Chen et al., 2015; Florou & Kosi, 2015; Kim et al., 2011).⁴ Moreover, the use of fair value accounting accelerates the recognition of good and bad news (Ball et al., 2015; Florou & Kosi, 2015).

Disclosing high quality financial information should increase a firm's propensity to receive a loan and influences the price and non-price terms of debt contracts in favor of the borrower (Bharath, Sunder, & Sunder, 2008; Jimenez, Salas, & Saurina, 2006). However,

⁴ For example, prohibition of the 'last in, first out' (LIFO) rule for valuing a firm's inventory. In our sample, countries where private firms employing local GAAP are permitted to use LIFO include Germany, Greece, Hungary and South Korea (Boadway, 1992).

empirical studies examining the relation between IFRS and debt financing report mixed evidence on publicly listed firms.

Kim et al. (2011) find that voluntary IFRS adopters are associated with lower interest rates, less restrictive covenants, and larger loans with longer maturities. Supporting these results, Florou and Kosi (2015) report that the cost of bank loans decreases with voluntary IFRS adoption. Other studies focusing on mandatory IFRS adoption find that firms experience an increase in loan interest rates, an increase in the likelihood that a loan is collateralized, a reduction in loan maturity, and diminished use of accounting-based financial covenants (Chen et al., 2015). Since results are more pronounced where opportunistic earnings management is likelier to occur, verifiability and reliability of the financial statements may be reduced as a consequence of IFRS adoption. Complementary, mandatory IFRS adopters are more likely to issue public bonds instead of bank loans and to have lower bond yield spreads (Florou & Kosi, 2015). Private loan spreads appear to be unaffected, though. In contrast to Chen et al. (2015), these results suggest that debt providers respond positively to the adoption of IFRS, but only when debt providers rely more on publicly available financial statements than private communication. Finally, Ball et al. (2015) examine the relation between mandatory IFRS adoption and accounting covenants in debt contracts. Consistent with the results of Chen et al. (2015), they find a significant decline in accounting covenants following the adoption of IFRS. Furthermore, accounting covenants are substituted by non-accounting covenants after the mandatory adoption of IFRS. Potential reasons for the reduction in accounting debt covenants include a reduction in contractibility, enhanced flexibility in selecting and applying accounting rules, increased rule-making uncertainty, and extended use of fair value accounting. IFRS adoption may therefore limit the use of accounting covenants in debt contracting. In sum, the literature indicates that IFRS adoption does not necessarily have a positive impact on bank debt

financing. Studies that focus on voluntary IFRS adopters find positive effects by and large, while studies that focus on mandatory IFRS adopters report no impact, or else a negative one.⁵

2.2. Private Firms' Costs and Benefits of Using IFRS

The previously mentioned studies on IFRS adoption and debt financing focus on publicly listed firms. In principle, the main arguments also apply to private firms but some characteristics of private firms can cause differences in effects. Private firms typically have a concentrated ownership structure that reduces agency costs to a minimum, whilst publicly listed firms have a separation of ownership and control that generates substantial agency costs (Ball & Shivakumar, 2005). Since the potential to reduce agency costs through greater information disclosure is low for private firms, it can be inferred that the benefits of high quality financial reporting is low as well.

Private firms are more likely to communicate through private channels in order to provide information to creditors and other stakeholders on their specific needs (Ball & Shivakumar, 2005; Burgstahler et al., 2006). This reduces the marginal increase in information that high-quality financial information based on IFRS can provide. In addition, key capital providers of private firms often supervise manager actively, affording them insider access to corporate information (Chen et al., 2011). It follows, therefore, that IFRS usage should have no effect on financing.⁶

However, recent studies focusing on firms' cost-benefit assessments of IFRS show that private firms voluntarily adopt IFRS when they have strong external financing needs (André et

⁵ Recent studies show that the improvement in reporting quality following IFRS adoption is confined to firms with strong incentives to increase their accounting quality (Christensen, Lee, Walker, & Zeng, 2015; Daske et al., 2013). IFRS itself may have no impact on the quality of financial statements, but it could be correlated with incentives to increase reporting quality. We discuss these incentives in greater detail in Section 4.2.

⁶ In addition, the direct cost of implementing IFRS is known to be substantial. For example, adopting firms have to adjust their software and accounting systems, spend additional resources on (re-)training staff, and hire experts (accountants and/or auditors) who are familiar with IFRS. The disclosure requirements under IFRS can also increase information collection costs (Bassemir, 2012).

al., 2012; Bassemir, 2012).⁷ The benefits of high-quality financial reporting would appear to be especially significant when close relationships with lenders are lacking or costly to maintain. For example, when a firm is in need of external capital to finance new investments, it can either negotiate a loan deal with a known bank (relationship lender) or consider contracts with formerly unknown banks (non-relationship lenders). Close relationships can become costly if the lender seeks to exploit its informational advantage by charging a premium over its less well-informed competitors (Rajan, 1992). Firms, therefore, have an incentive to decrease their dependency on a single relationship lender. However, potential lenders are at an informational disadvantage relative to relationship lenders and may surmise that the firm has a low creditworthiness (Detragiache, Garella, & Guiso, 2000). In such situations, high-quality financial reporting can mitigate adverse selection problems.

Moreover, some firms are unable to obtain additional finance from their relationship lender even when the lender believes the project to be profitable. This situation can occur when, for instance, banks are compelled to reduce their loan portfolio due to an unexpected loss of liquidity (Detragiache et al., 2000). Alternatively, new investments can be considered ineligible for loans if their risk profile exceeds a bank's internal standards, or if they fail to meet regulatory requirements. In this situation, new investments can only be funded by loans from alternative lenders. IFRS usage increases the visibility of private firms to alternative lenders and reduces informational asymmetries. This can reduce the dependency of private firms on a single relationship lender and generate capital inflows over time.

On the whole, voluntary IFRS usage is unlikely to impact relationship lenders who focus on non-public information, whilst non-relationship lenders who grant loans to more transparent

⁷ Other reasons why private firms adopt IFRS are high agency and information processing demands when ownership and control are separated, and greater internal information processing demands due to informational and organizational complexity (Bassemir, 2012). These incentives to use IFRS are discussed in greater detail in Section 4.2 where an overview of our control variables is provided.

firms may well offer debt contracts on better terms and conditions (Beck & Demirguc-Kunt, 2006; Berger & Udell, 2006).

In our empirical analysis, we distinguish between loans received from domestic banks, which are typically relationship lenders, and loans received from foreign banks, which are typically non-relationship lenders. Information-based theories on relationship lending suggest that foreign banks tend to have fewer personal contacts and longer-distance associations with their borrowers, and rely more heavily on publicly available financial statements compared to domestic banks (Berger, Klapper, Peria, & Zaidi, 2008). Foreign banks are less able to process ‘soft’ information from opaque firms located in foreign countries (Berger et al., 2008), and generally face an informational disadvantage relative to local investors (Brennan & Cao, 1997). Specific domestic sources of information, such as internal reports, are less useful and often unavailable to foreign lenders. In addition, foreign lenders are presumably more familiar with IFRS than local accounting standards, giving them an advantage in evaluating firm-specific risks when internationally comparable financial information is available (Kim et al., 2011). Therefore, we expect IFRS usage to have a positive effect on the propensity to receive a loan from a foreign bank.⁸

3. Empirical Analysis

3.1. Data Source

The empirical analysis is based on the Business Environment and Enterprise Performance Survey (BEEPS) that was conducted by the European Bank for Reconstruction

⁸ In principle, one could expect a negative effect if the above-mentioned mechanisms for mandatory IFRS adoption apply. For example, Ball et al. (2015) show that IFRS usage reduces contractibility of the financial statements that firms provide to lenders. They demonstrate that banks use accounting covenants less often than non-accounting covenants in debt contracts when firms adopt IFRS. This can produce a negative effect on the ability to attract debt. However, it is unclear if this applies to loans that firms receive from foreign banks. Banks only use accounting covenants when they trust the information that firms provide. If foreign banks are more familiar with IFRS than foreign GAAP, it is less likely that contractibility will be reduced by using IFRS. A sensitivity analysis (Ball et al., 2015, p. 956) partially confirms this reasoning. In the case of international loan contracts, they report a positive, albeit insignificant, effect on debt covenants from the adoption of IFRS. This indicates that, for foreign banks, no reduction in contractibility due to IFRS is present.

and Development (EBRD) in partnership with the World Bank. We use the third wave of this survey, which was carried out between the last quarter of 2004 and first quarter of 2005. It comprises 14,107 enterprises from 34 European and Asian countries. The primary purpose of the survey was to identify the main constraints on the business activity of firms. This version is of particular relevance to our purposes as it includes information on private firms' internal accounting practices. The identity of firms is not disclosed to ensure the greatest degree of survey participation, integrity and confidence in the quality of the data.

We remove Bulgaria, Croatia, Georgia, Serbia and Montenegro from the sample because private firms in these countries were required to adopt IFRS during the time period 2004-2005.⁹ The small number of non-missing observations in these countries render an in-depth study of mandatory IFRS adoption impossible. Next, we remove 1,202 firms that are active in the financial, public administration, health and social sectors, as well as 191 publicly listed firms and 796 state-owned firms. We then remove 7,066 firms with missing data on one of our outcome variables or control variables.¹⁰ Finally, we omit 339 firms that apply reporting standards other than IFRS or local GAAP. By following this procedure, we arrive at a final sample of 3,477 private firms from 25 countries.¹¹ This sample is comparable to the original sample in terms of firm size, age and industry. In addition, we compare the data that is available in the BEEPS survey with the widely used Amadeus database. No notable differences exist in terms of industry composition. However, firms in our sample are slightly larger and older than firms in the Amadeus database because the initial sample was drawn from national registers of

⁹ 1,036 firms drop out the sample due to this restriction.

¹⁰ The original sample from the EBRD and World Bank include outliers. We have, therefore, removed from our main analysis one firm with more than 6000 employees. All results are robust to using truncated variables.

¹¹ Five countries are eliminated from the final sample because of missing values (Azerbaijan, Belarus, Ireland, Spain and Uzbekistan).

firms with at least 2 employees. For further details, see the report on sampling and implementation of the BEEPS (EBRD, 2005).¹²

3.2. Usage of IFRS

The third wave of the BEEPS survey includes information on the accounting standards that each firm uses.¹³ We compare firms that only use local accounting standards with firms that use IFRS. The share of the latter group amounts to 12.08 percent in the sample. Table 1 presents the sample breakdown by country and the details on country-specific rules regarding the adoption of IFRS by private firms. We report the date when private firms can effectively adopt IFRS for statutory purposes and indicate if they are allowed or required to adopt IFRS from that point onwards.

It is important to note that not all countries under consideration explicitly allow private firms to adopt IFRS for statutory financial statements. Hence, not all private firms are allowed to use IFRS for their statutory financial statements which are disclosed to the public. However, these firms can still use IFRS for dual reporting, reconsolidation, or for other financial reports. These financial reports are regularly not publicly available, but they may be disclosed to stakeholders through private channels.¹⁴ As there is no obligation on private firms to publish these additional reports, survey data is one of the few ways to examine IFRS usage by private firms across multiple countries and jurisdictions.

¹²Prior literature has shown that private firms that adopt IFRS are likely to be larger and internationally active (André et al., 2012; Bassemir, 2012). In our matching estimation, we compare IFRS firms with local GAAP firms that are comparable in terms of size, age, industry, and other characteristics. Moreover, when we eliminate firms with less than 2 employees in the Amadeus database, the average number of employees is statistically the same as for the year 2004. Firms are still slightly older (a median difference of 1 year (average 1.7 years), which is explained by the fact that the BEEPS survey was partly carried out in 2005.

¹³ Table 2 includes the exact phrasing of the question.

¹⁴ This practice is also confirmed by Reports on the Observance of Standards and Codes from the World Bank (2015a). They report that, in countries where national legislators neither require nor permit private firms to use IFRS to prepare their statutory financial statements, some private firms voluntarily compose complementary financial reports according to IFRS. These financial reports are generally not publicly available but are used for internal purposes or disclosed to third parties through private channels (World Bank, 2015a).

The IFRS variable included in the BEEPS survey combines five different types of IFRS usage: (1) firms that have either two separate sets of financial statements, one according to local GAAP (to satisfy regulatory requirements) and one according to IFRS, (2) firms that have one set of financial statements according to local GAAP and provide reconsolidation to IFRS, or vice versa, (3) firms that have one set of financial statements that complies with both IFRS and local GAAP by explicitly using accounting measurement options in local GAAP that accord with IFRS, and that provide supplementary disclosure required under IFRS, (4) if allowed by national regulators, a single set of financial statements that comply only with IFRS, or (5) firms that claim to have used IFRS without complying with all the standards. Therefore, these firms did not ‘*adopt*’ IFRS in the strict sense, since ‘adoption’ according to the IASB (see IFRS 1, para. 3) is ‘full compliance with IFRS in the preparation of financial statements’. However, private firms could still ‘*use*’ these standards to create (additional) financial reports. In consequence, our measure captures a variety of strategies that private firms deploy in relation to IFRS.¹⁵ All managers who confirmed using IFRS in the BEEPS survey have used it in one of these ways. However, we are unable to make an empirical distinction between these five different types of IFRS usage.¹⁶

To validate the IFRS indicator, we compare the country rate of IFRS usage with other studies and databases. Sellhorn and Gornik-Tomaszewski (2006) report that 8% of unlisted firms in Germany used IFRS in 2004 by means of dual reporting. In our dataset, 10.33% of the unlisted German firms aver that they use IFRS. Using data from the German corporate register, Bassemir (2012) reports a slightly higher percentage of 11% over the period 1998-2009. In addition, we searched the widely used Amadeus database. Out of all non-financial private firms

¹⁵ Note that these patterns of IFRS usage are not unique to our context. Similar patterns are observed in studies that focus on listed firms (see e.g. the appendix in Daske et al., 2013).

¹⁶ In the results and robustness sections, we further investigate differences between these heterogeneous IFRS users by using different subsamples where firms are more likely to have ‘adopted’ IFRS rather than merely ‘used’ it.

with consolidated financial statements in Amadeus, 9.66% of German firms adopted IFRS in 2004.¹⁷ Hence, most firms in the BEEPS that claim they use IFRS are likely those that actually create financial reports based on IFRS.¹⁸

<<<<<Insert Table 1 about here>>>>>

3.3. Domestic and Foreign Loans

Our main dependent variable is the percentage of new fixed investments that are financed by domestic loans and foreign loans. Alternatively, we use dummies that indicate whether a new fixed investment was financed by either a domestic or a foreign bank to examine the difference in the propensity to receive a domestic or a foreign loan. In robustness checks, we further investigate how IFRS usage is associated with the annual rate of interest, the value of collateral required, the duration of the loan, and the time period when the loan is received.

4. Research design

Empirical analysis must account for the fact that IFRS usage does not happen randomly. Expected benefits and costs of IFRS usage are related to varying incentives to increase accounting quality (Christensen et al., 2015; Daske et al., 2013). André et al. (2012) and Bassemir (2012) show that size, growth opportunities, internationalization and complexity are

¹⁷ The variable available in the Amadeus database on firms' accounting standards does not differentiate between local GAAP and IFRS for most of the countries. For example, in some countries where IFRS has recently been required by private firms for statutory purposes (e.g. large firms in Bulgaria, or all firms in Macedonia and Bosnia Herzegovina) the database indicates that all firms use local GAAP whereas, for other countries that also require IFRS adoption, the database correctly specifies the use of IFRS for all private firms (e.g. Cyprus). Hence, only a few data providers in the Amadeus database distinguish between both standards.

¹⁸ Moreover, in this version of the BEEPS, the EBRD made an effort to create a high quality measure that examines which accounting standards are used by private firms. A previous version of this survey has been used by Francis, Khurana, Martin, and Pereira (2008); however, the quality of the IFRS variable is questionable in this version (see Nobes (2010) for a detailed discussion). Due to the low quality of the responses on the IFRS question, the EBRD, in partnership with the World Bank, rephrased the question in the third edition of the BEEPS that we use. Additionally, the responses to the questions are now validated and checked. Observations that are, or appear to be, inaccurate or misleading are discarded. These quality checks are not reported in the first wave of the survey used by Francis et al. (2008). Moreover, the reports on sampling and implementation in the third wave of the BEEPS indicate the countries where respondents had difficulties answering certain questions (EBRD, 2005). For 22 countries in our sample, no cases were reported where firms had trouble answering the IFRS question. Our results are robust to excluding Armenia, Bosnia and Herzegovina and Tajikistan where some respondents had difficulty answering the question.

important motives for private firms to increase their accounting quality and to adopt IFRS. Hence, in order to estimate the effect of IFRS usage on access to external finance, it is important to find a control group of firms that is comparable in terms of these firm characteristics.

The econometric literature proposes different estimation techniques to correct for such selection biases, including difference-in-difference estimators, control function approaches, instrumental variable estimation and non-parametric matching (Heckman, Ichimura, & Todd, 1997; Imbens & Wooldridge, 2008). We apply a non-parametric matching approach. The difference-in-difference method requires a panel data set where firms are observed before as well as after IFRS adoption. As our data is a cross-section and the change in use of IFRS is unobservable, we cannot apply this estimation technique. Other studies on the voluntary adoption of IFRS employ a two-stage control function approach (Kim et al., 2011). Lennox, Francis, and Wang (2011) show, in their review of 75 accounting papers, that many researchers tend to implement this technique in a mechanical way, without valid exclusion restrictions or theoretical justification. Selection models in previous accounting literature have typically used ROA, leverage, sales growth, percentage of foreign sales to total sales, percentage change in equity and debt financing, and cross listing as instruments in the first stage of calculating the propensity to apply IFRS (e.g., Kim et al., 2011). Some of these variables form exclusion restrictions in the second stage. The assumption that these instruments have no impact on the main dependent variable (e.g. debt loan spreads, larger loans or longer maturities) is, however, questionable. In the absence of valid instruments, which are notoriously scant, we refrain from using two-stage selection models.

The remaining option is a non-parametric matching approach, which has a number of important advantages over parametric models (Imbens & Wooldridge, 2008). Most importantly for our purposes, non-parametric matching allows us to mitigate selection biases attributable to the most common selection criteria, including firm size, productivity, internationalization and

firm complexity, among others. A limitation of this approach is that we can only control for self-selection according to observable characteristics. We address this issue by employing an extensive set of matching criteria that arguably tackles the most prevalent forms of self-selection into IFRS usage. Calculation of Rosenbaum Bounds show that unobservable factors need to have a very large effect if they are to render our main results invalid.

4.1. Propensity Score Matching

A non-parametric matching approach matches observations based on a distinguishing feature or treatment. The treatment in this study is the use of IFRS and the treatment effect is defined by:

$$E(\theta^1) = E(Y^1 | S = 1) - E(Y^0 | S = 1) \quad (1)$$

Where S refers to the treated (use of IFRS; $S = 1$) and non-treated firms (use of *only* local GAAP; $S = 0$). Y^1 denotes the outcome variable of interest (i.e. bank loans to finance new fixed investments) when firms apply IFRS, while Y^0 is the potential outcome realized if the treatment group had not been treated. The difference between Y^1 and Y^0 is equal to the treatment effect θ^1 . Because Y^1 and Y^0 cannot be observed simultaneously for the same observation, we have to estimate the counterfactual situation.

An unbiased estimation of the treatment effect θ^1 is based on the conditional independence assumption developed by Rubin (1977). The implication for our study is that a firm's access to debt finance and the use of IFRS are independent from a set of exogenous characteristics X . Hence, the critical assumption is that we are able to control for the factors determining IFRS usage. If this assumption is satisfied, the following equation holds:

$$E(Y^0 | S = 1, X) = E(Y^0 | S = 0, X) \quad (2)$$

We must, therefore, construct a control group that is comparable to the treated group in characteristics that influence the decision to use IFRS. The outcome of the control group can

then be used to estimate the counterfactual situation for firms that use IFRS. On the condition that there are no systematic differences between the treatment group and the control group, the treatment effect can be estimated as:

$$E(\theta^1) = E(Y^1 | S = 1, X) - E(Y^0 | S = 0, X) \quad (3)$$

Since the production and use of financial statements based on IFRS is determined by a multitude of factors, we apply the propensity score matching approach designed by Rosenbaum and Rubin (1983). We reduce multiple matching criteria (X) to a single index by means of a probit model. The list of matching criteria (X) is described in detail in Section 4.2 and summarized in Table 2. The probit model estimates the propensity that a particular firm uses IFRS and the resulting propensity scores ($\hat{P}(X)$) are subsequently used as a single matching argument. To maintain consistency, we restrict the sample to common support, i.e. the control group contains at least one suitable candidate for each treated firm.¹⁹

The following procedure determines the matched sample. First, we calculate the Euclidian distance (d_{ij}) between the estimated propensity score of a randomly selected treated firm (i) and each firm from the control group (j).

$$d_{ij} = \hat{P}(X_i) - \hat{P}(X_j) \forall j = 1, \dots, N^0 \quad (4)$$

Next, we impose the restriction that treated firms are only matched to non-treated firms from the same country, on the basis that each country has different regulations and specific differences between local GAAP and IFRS. We then construct the matched sample by matching control firms with the smallest distance to each IFRS-using firm on a one-to-one basis. This

¹⁹ We follow the econometric literature and restrict the sample to common support by deleting observations of treated firms with probabilities greater than the maximum and smaller than the minimum in the potential control group.

procedure is repeated for every firm that uses IFRS. If no potential control observation remains in the pool after applying the previous restrictions, firm i is removed from the analysis.²⁰

After we have identified the nearest neighbor for each treated firm, we can calculate the treatment effect (IFRS usage) by taking the mean difference of the dependent variable in question between the treated and non-treated firms:

$$\hat{\theta}^1 = \frac{1}{n^1} \left(\sum_{i=1}^{N^1} Y_i^1 - \sum_{i=1}^{N^1} Y_i^0 \right) \quad (5)$$

With Y_i^0 being the counterfactual for i and n^1 being the sample size of treated firms.

4.2. Matching Criteria

To address self-selection into IFRS usage, we match on all observable firm characteristics that influence the choice of using IFRS. A first important matching criterion is firm size, as measured by the number of fulltime employees in t_3 .²¹ The internal and external demand for higher informational transparency increases with firm size. Larger firms are also expected to have better governance structures that facilitate external financing (Bassemir, 2012). In addition, generating financial statements based on IFRS is costly, and large private firms can spread these costs over a large scale. In line with these arguments, we also match on firm age. Older firms are likely to have more stakeholders, which strengthens the need to increase their reporting transparency.

<<<<<Insert Table 2 about here>>>>>

²⁰ Note that we do not remove the selected control firm from the pool of potential controls, so that it can be used again. By applying this method, we obtain a control sample that has greater similarity to the treated group than a method using matching without replacement. For example, if replacement is not used, a number of treated firms would be matched with the second best option (or even a less good option), since the closest neighbor is already matched to another random treated firm. In our main results, less than 5% of cases in the control group are used more than twice, with eleven the maximum number of times one control observation is used. The only inconvenience of using the method with replacement is that one has to take into account the lack of independence between the treated firms that have the same control. In our main analysis below, we solve this by calculating the corrected standard errors based on Lechner's approximation (Lechner, 2001). In Section 6.4, we return to this topic.

²¹ Firms have been asked for employment levels in t and t_3 only.

Other important sources of selection are organizational complexity and internationalization (André et al., 2012; Bassemir, 2012). When a firm's organizational structure becomes more complex, it is likely to influence its reporting strategy. Hence, we include a measure determining whether a firm is part of a group. Firms that use IFRS tend to be part of a larger network of subsidiaries (Bassemir, 2012). In addition, firms that belong to a group often create consolidated financial statements. By matching on group structure, we partially take into account differences in the propensity to use IFRS in consolidated and unconsolidated financial statements (André et al., 2012; Nobes, 2010). Furthermore, the parent company can force managers of subsidiaries to use IFRS, since the discretion that local GAAP provides in some jurisdictions could mask their performance from the parent company (Bassemir, 2012). The internal demand for higher informational transparency is likely to increase when firms have a large number of intragroup transactions. We, therefore, include the percentage of domestic sales to the parent company or affiliated subsidiaries as an additional matching criterion.

In addition to organizational complexity, geographic dispersion of a firm's operation can play a role in the demand for greater transparency (Bassemir, 2012). Multinational private firms have foreign suppliers and customers. Information asymmetries can increase with various foreign stakeholders because of cultural and legal diversity, different labor markets, multiple currencies, and language differences (Duru & Reeb, 2002). Hence, we include the percentage of foreign ownership, the percentage of goods imported, and the percentage of goods exported as matching criteria.

Another potential source of self-selection into IFRS is firm performance. Well-performing firms can disclose additional information to signal their superior performance (Allee & Yohn, 2009). We proxy for firm performance by calculating the firm's productivity over the two-digit ISIC sector average at time $t-3$. If the obtained ratio is greater than 1, the firm

performs better than the average in terms of productivity.²² Additionally, we include growth as a matching criterion. We proxy for growth by using sales growth between t and $t-3$ to control for growth prospects. Firms with abundant growth opportunities are more likely to need external financing to fund additional projects (André et al., 2012; Bassemir, 2012).²³

Another matching criterion is the presence of a controlling owner or blockholder. A controlling owner in a private company is more likely to exploit creditors and minority shareholders by extracting private benefits of control. A controlling owner is less likely to voluntarily report information when shareholder structures are more dispersed (Hope, Thomas, & Vyas, 2011).

Our next matching criterion is the proportion of internal funds. High-equity firms can be subject to a demand for increased disclosure by minority owners (Fan & Wong, 2002). In addition, a greater dependency on equity financing means lower leverage. Firms with more mature debt are likelier to increase their reporting transparency to improve the firm's access to external finance (Kim et al., 2011). Internal funds and leverage are proxied by the proportion of a firm's working capital financed from internal funds and retained earnings.²⁴

We also include a firm's human capital as measured by the percentage of the workforce with a university degree, based on the intuitive sense that managers with a higher education understand the impact of reporting quality on capital providers' risk perceptions (Bamber, Jiang, & Wang, 2010).

Innovative firms that invest in R&D tend to face great uncertainty in terms of their project outcomes. These firms find it particularly difficult and costly to raise external funds

²² However, prior research fails to document a significant relation between profitability and voluntary adoption of IFRS by private firms (André et al., 2012; Bassemir, 2012).

²³ As an alternative proxy for performance, we use sales divided by the replacement value of the physical production assets. Results are presented in Section 6.4.

²⁴ As an additional check to control for past financing, we follow the same approach as Hope et al. (2011) by controlling for loan age, loan maturity, interest rate and collateral requirements. Results are discussed in Section 6.4.

(Czarnitzki & Hottenrott, 2011). We control for innovative input by including a dummy variable, indicating whether a firm has invested in R&D, and another dummy variable, indicating whether a new product has been introduced within the last three years.

Finally, a full set of country and industry dummies are included as matching criteria. In that way, we control for differences in a country's legal and political systems, which have been shown to have direct and indirect effects on the accounting quality of firms (Soderstrom & Sun, 2007).

5. Results

5.1. IFRS and Debt from Banks

Our sample comprises 3,477 firms of which 420 firms use IFRS. The other 3,057 firms use only local GAAP. Firms in our sample are relatively small because our focus is confined to private firms. The average firm has 67 employees. 80 percent of the companies have less than 50 employees and 6 percent have more than 250 employees. The average firm is approximately 15 years old, and the largest owner owns, on average, 76 percent of the equity.

Table 3 reports descriptive statistics on the unmatched and matched samples. First, we examine differences in the unmatched sample. We compare firms that use IFRS with the potential control group (i.e. all firms that rely exclusively on local GAAP). We provide p -values associated with two-sided t -tests of mean equality to compare differences in our matching criteria and outcome variables between the 420 treated firms that use IFRS and the 3,057 non-treated firms.²⁵ We observe that almost all firm characteristics are significantly different between both groups, supporting the use of a large number of matching criteria. IFRS users are significantly larger, older and more productive – confirming a potential self-selection bias

²⁵ For the sake of brevity, we only report descriptive statistics on the treated firms that are eventually matched following our protocol introduced in Section 4.1. Due to the common support restriction, three treated firms are eliminated from the sample. No statistical differences exist between the full set of the treated firms (420 IFRS firms) and the sample of treated firms where firms are excluded because of the common support restriction (417 IFRS firms).

concerning better-performing firms that signal higher quality as a result of using IFRS. This implies that there are non-trivial direct costs involved in the use of IFRS, since larger firms seem to dominate the sample of IFRS users. We also see that firms using IFRS have less internal funds and more debt. Additionally, these firms are associated with greater investment in R&D and more innovative products, which can be seen as an indicator of future growth and debt increase. Firms that use IFRS tend to have a better educated workforce, leading to the prediction that more highly educated managers will be likelier to understand the impact of reporting quality on capital providers' risk perceptions. Lastly, IFRS users export and import more, have a higher propensity to belong to a group, are more often owned by a foreign entity, and have more intragroup sales. The international focus associated with these firms renders them more inclined to disclose financial information based on IFRS. Besides these differences, there is no evidence that sales growth is significantly different between the two groups. Jointly considered, the descriptive statistics indicate important differences in firm characteristics between private firms that use IFRS voluntarily and those that rely exclusively on local GAAP. There is a strong positive correlation between IFRS usage and firm characteristics that drive the demand for transparent reporting.

Regarding the outcome variables, the descriptive statistics indicate that firms using IFRS are associated with a significantly higher propensity to finance their fixed investments through domestic (33.1% vs. 24.1%) or foreign loans (9.6% vs. 2.3%) and are associated with the financing of a significantly higher percentage of their fixed investments through domestic (14.6% vs. 12.1%) and foreign loans (4.3% vs. 1.1%), respectively. This is consistent with Kim et al. (2011) who find a significant positive association between the use of IFRS and the ability of public firms to receive external finance.

<<<<<Insert Table 3 about here>>>>>

We now turn to the propensity score matching results. First, we estimate a probit model to measure the propensity to engage in the voluntary production of statements based on IFRS. We regress our IFRS variable on all the matching criteria summarized in Table 2.²⁶ We use the estimated propensity score to balance the samples, i.e. IFRS users are matched to a control group on a one-to-one basis, which maximally resembles the treated firms on all characteristics that influence the propensity to use IFRS. After restricting the sample to common support, only 3 out of 420 treated firms drop out, i.e. we find broad support for the treatment group.

Our results on the matched sample in Table 3 confirm that the matching procedure successfully balanced the samples of treated and untreated firms. No significant differences in firm characteristics remain after matching, mitigating self-selection into IFRS.²⁷ Any remaining differences in the dependent variables in question can be attributed to the use of IFRS, on the assumption that no unobserved covariates are systematically correlated with IFRS usage and access to bank finance.²⁸ We calculate the estimated treatment effect by taking the difference in means between both groups.

The matching procedure reveals that IFRS usage is associated with a significantly (p -value < 0.1) higher propensity to receive debt from foreign banks in order to finance new fixed investments as well as a higher proportion of new fixed investments financed by foreign banks. While the absolute size of the differences appears to be small, the relatively higher magnitude associated with IFRS usage is substantial and economically meaningful. IFRS users have an 81% higher chance of receiving a foreign loan (absolute change from 5.3% to 9.6%). Moreover, on average 4.33% of total new fixed investments by IFRS users are financed through foreign

²⁶ The probit estimation (untabulated) shows a positive significant association between the decision to use IFRS and the variables: Group, Internal Sales, Foreign, Export, Human Capital, R&D and New Product. A significant negative association is found for the variable Blockholder.

²⁷ To further test our assumption that the treated group and the control group have a similar likelihood of adopting IFRS, we estimate a probit model on the newly matched sample (untabulated). None of the matching criteria have a significant impact on the likelihood of adopting IFRS.

²⁸ This assumption is further investigated in the robustness analyses using Rosenbaum bounds (Section 6.1).

loans, which is approximately twice the percentage employed by firms using only local GAAP. These findings are consistent with the notion that the use of IFRS enhances a firm's transparency to foreign lenders and increases its comparability in the international loan market (Kim et al., 2011). Although statistically significant at a rather low level, they nevertheless indicate that the use of IFRS by private firms has a positive effect on access to foreign capital.

After matching, we find that support for the descriptive finding that IFRS-using firms have a higher propensity to receive domestic loans is erased. The descriptive statistics in the unmatched sample seem, therefore, to be driven by self-selection effects. This finding is consistent with the notion that IFRS usage does not improve a firm's transparency to domestic lenders. Typically, these lenders have access to various other private sources of information, which makes financial statements based on IFRS less useful.

5.2. The Role of Enforcement

While IFRS usage is associated with a greater chance of receiving bank debt in the full sample, the magnitude of the effect may actually vary with the strength of the local enforcement regime (Ball et al., 2015; Christensen, Hail, & Leuz, 2013; Florou & Kosi, 2015).

On the one hand, stronger enforcement could mitigate the greater flexibility inherent in IFRS, which increases the usefulness of financial statement information for debt contracting. This could be particularly relevant for private firms since earnings management practices are frequently observed in private firms (Burgstahler et al., 2006). Low-regulatory enforcement reinforces the problem because it can be almost costless for firms to adopt IFRS merely in name (Ball, 2006). Furthermore, a lack of enforcement makes it more costly and difficult for investors to determine which IFRS adoptions are trustworthy. It follows that enforcement shapes firms' reporting incentives (Ball, Robin, and Wu, 2003; Ball and Shivakumar, 2005; Burgstahler, Hail, and Leuz, 2006). Firms that operate in low-regulatory countries have less incentive to use IFRS because the signal of using IFRS is weaker compared to firms situated in countries with strong

enforcement. Therefore, we would expect to find a weaker association between IFRS usage and bank financing in countries with low regulatory quality.²⁹ On the other hand, debt contracting terms can substitute for poor country-level enforcement mechanisms, rendering the enforcement regime irrelevant (Ball et al., 2015).

In order to test this assumption empirically, we follow the literature (Ball et al., 2015; Christensen et al., 2013) and proxy IFRS enforcement strength per country with the regulatory quality index of Kaufmann, Kraay, and Mastruzzi (2009).³⁰ The index measures a country's ability to implement regulatory and government policies that permit and promote private sector development. It is based on various dimensions of regulatory quality from 16 different data sources. The measure of enforcement strength ranges from -2.5 (weak) to 2.5 (strong). We split our sample into countries that score above zero and those that score below zero.³¹ This produces 14 countries in our sample with a strong enforcement regime, accounting for 2,216 firm-year observations, and 10 countries with a weak enforcement regime, accounting for 1,261 firm-year observations. Then, we employ the matching protocol introduced in Section 4.1 for both subsamples separately. Table 4 presents the results for countries with strong and low enforcement regimes.

<<<<<Insert Table 4 about here>>>>>

The matching procedure successfully balances the samples of treated and untreated firms for both subsamples. Considering countries with strong enforcement regimes, the results for the full sample that we presented previously become more pronounced in terms of statistical

²⁹ Consistent with this explanation, Kim et al. (2011) show that listed firms that voluntarily adopt IFRS have a higher number of lenders, less restrictive covenants, and longer loan maturity in countries with strong legal enforcement regimes compared to voluntary adopters in low enforcement regimes.

³⁰ We use the most recent version (2015) of the index, which is publicly available at: <http://www.govindicators.org>. The updated version of the index incorporates revisions from previous years. Using older versions of the index, as with Ball et al. (2015) and Christensen et al. (2013), provide the same results qualitatively. Our results are comparable in terms of statistical significance and economic magnitude if we use the rule of law index of Kaufmann et al. (2008) instead of the regulatory quality index. Other proxies often used in the literature are only available for a small subset of countries covered in our study.

³¹ Splitting at the median reveals the same results qualitatively.

significance as well as economic magnitude.³² Firms that operate under strong regimes and use IFRS are associated with an almost 9 times greater chance of securing access to foreign loans (absolute 11.8% vs. 1.4%, p-values < 0.001), which is compared with an almost 11 times larger percentage of foreign loans used to finance new fixed investments (absolute 4.78% vs. 0.46%, p-values < 0.001). The finding that IFRS users do not benefit from IFRS usage through enhanced prospects of securing access to domestic banks' capital remains unchanged.

Considering countries with a weak enforcement regime, the positive association between IFRS usage and access to foreign debt disappears. Consistent with our other results, no significant relationship between IFRS usage and access to debt from domestic banks is evident.

Table 5 reports the average treatment effects for our outcome variables and tests for differences across and within high and low enforcement countries. It confirms that the differences in the average treatment effects between strong and weak enforcement regimes are significant. In particular, we find that the treatment effect is significantly greater for foreign loans in high enforcement countries compared to weak enforcement regimes. No significant differences are found with regard to domestic loan financing in high and low enforcement countries.

Tests for differences within the subsamples also confirm that, in strong enforcement countries, the effect of IFRS usage is statistically greater for foreign loans compared to domestic loans, providing further support for the notion that IFRS is principally associated with non-relationship lenders. Jointly considered, firms seem to be able to make a credible commitment to foreign lenders by voluntarily using IFRS, conditional on strong regulatory enforcement.

³² As an additional test, we run our analysis on an individual country level for 5 countries of each subsample that have the most firm observations. We find that all countries with strong enforcement have a positive association – albeit periodically insignificant (2 out of 5). When countries with weak enforcement are examined, we find an insignificant positive association in 4 out of 5 cases. Vietnam is the only negative association found but, with only 3 IFRS users, this carries no significance. Given the sometimes low number of IFRS users per country, it is hardly surprising that the significance level drops.

<<<<<Insert Table 5 about here>>>>>

These results are consistent with earlier findings, showing that private firms make significantly greater use of earnings management in countries with weak enforcement regimes (Burgstahler et al., 2006). Firms in these countries are less likely to improve their financial disclosure through IFRS usage. Moreover, if enforcement is weak, it may prove too costly for foreign banks to determine the extent to which firms can significantly improve their transparency and reliability (Ball, 2006).

6. Robustness Tests and Limitations

6.1. Selection Bias due to Unobservable Factors

One caveat in our empirical analyses resides in the conditional independence assumption, i.e. we are only able to control for potential selection biases caused by observable firm characteristics. Although we employ an extensive set of variables, the methods applied are not necessarily robust when measured against unobserved variables affecting both the treatment and outcome variables. To address this issue, we calculate Rosenbaum bounds that help to determine how strongly a potential unobserved variable would need to affect selection into treatment in order to undermine the results (Rosenbaum, 2002).

We calculate Mantel and Haenszel (1959) (MH) test statistics and associated p -values for the treatment effect, considering different levels of potentially hidden biases (Γ). By comparing different levels of Γ , we can assess the strength of unobserved influences that would be necessary to render the estimated effects endogenously determined. It is important to note that the Rosenbaum bounds do not indicate whether biases exist or which magnitudes are plausible, but they allow us to assess the degree of concern we should have over unobserved factors that potentially alter the estimated relationship.

Table 6 presents the results following Rosenbaum's (2002) approach of bounding the treatment effect estimates. The interpretation is straightforward. When there is no positive or

negative hidden bias ($\Gamma = 1$), no unobserved selection bias exists. In this case, the MH test statistics give a similar result to our main analyses, indicating a significant influence of IFRS usage on our outcome variable, access to foreign loans. By increasing Γ , we gradually augment the strength of the (potential) bias that was uncontrolled in our previous analyses. For both positive and negative biases, we calculate, respectively, the upper bounds and the lower bounds of the MH statistics to reveal the point at which our results become insignificant. The upper bound of the MH statistic ($Q^+(MH)$) adjusts the MH statistic downward for positive unobserved selection. In our context, a positive selection bias occurs if firms using IFRS have improved access to foreign debt even without using IFRS and with the same vector X as firms in the control group. The lower bound of the MH statistic ($Q^-(MH)$) measures the opposite. It adjusts the MH statistic downward for negative correlations with (unobserved) selection factors. Given that we have a positive estimated treatment effect, the bounds derived under the assumption that we would underestimate the true treatment effect are somewhat less interesting. This is because, if the effect is underestimated, the effect is significant under $\Gamma = 1$ and would increase in significance for increasing values of Γ .

Table 4 indicates that IFRS usage is positively associated with debt that is attracted from foreign banks in countries with strong enforcement regimes. Table 6 shows that the critical point when our estimated effect of IFRS usage on ‘Access to Foreign Loans’ becomes insignificant is $\Gamma = 4.55$. This implies that firms with the same matching criteria should differ in their propensity to use IFRS due to unobserved factors by at least 355% before the results are undermined. These are conservative assessments since it is assumed that those unobserved differences perfectly determine the outcome variable. Otherwise, even larger differences would need to be present in order to modify our results.

Given the large critical Rosenbaum bounds and the large number of matching criteria employed, we are confident that any remaining unobserved variables that simultaneously affect

selection into IFRS usage and the ability to receive foreign loans will not alter the statistical significance of the estimated effects.

<<<<<Insert Table 6 about here>>>>>

6.2. Selection of Countries and Firms

In a few countries, we observe a relatively large number of IFRS users, which raises the concern that either the sample is not representative in these countries or some special local regulations apply that lead to incomparable cases. For instance, 36.17% of firms from the Kyrgyz Republic indicate that they use IFRS (see Table 1). As all private firms in this country were required to implement IFRS by 2009, some firms could have anticipated the law change and adopted IFRS earlier. Armenia and Estonia have many IFRS-using firms (>20%), which may be due to the fact that their local GAAP is quite similar to IFRS.³³ Therefore, we re-estimated all previous models after we had removed all countries where more than 20% of firms indicate that they use IFRS. Table 7 presents our results. The previously presented results remain qualitatively the same.³⁴ Furthermore, if the IFRS variable captures some firms using IFRS in a less meaningful way than others, our observed effect would actually be an underestimate. In this scenario, less meaningful use of IFRS should have a lesser effect on the propensity to receive foreign loans, or indeed have no effect at all.³⁵

<<<<<Insert Table 7 about here>>>>>

6.3. Excluding Firms that do not need a Loan

³³ Estonia was the first member of the European Union to commit to country-wide IFRS adoption. IFRS was adopted before any requirement to implement the EU Regulation, beginning in 1998 for all listed companies and in 2003 for all financial institutions. Estonia also made a commitment to permit IFRS in both consolidated financial statements and separate financial statements for all private firms.

³⁴ In our main analysis, 65% of IFRS-using firms indicate that they use IFRS in addition to local GAAP. The remaining percentage uses only IFRS. This number is partially driven by countries where firms are allowed to adopt IFRS for their statutory financial statements. However, in some countries where sole reliance on IFRS is prohibited, some firms still indicate use of only IFRS. This is, in principle, not possible. In alternative estimations, we therefore remove from the sample private firms that solely use IFRS, retaining only firms that use IFRS in addition to local GAAP. Again, all our results remained qualitatively unaltered.

³⁵ We also ran our analyses for Germany only, which accounts for 22.83% of our firm observations. We find similar effects to our main analyses in the high enforcement countries. Again, when we remove Germany from the sample, our results remain unchanged.

The descriptive statistics (Table 3) show that a substantial proportion of private firms used neither domestic nor foreign loans to finance new fixed investments. Some of the firms may not have required external debt. This could produce an overestimation of our effects if firms using IFRS have better growth opportunities and are, therefore, in greater need of debt financing. Although we already control for growth opportunities in our matching procedure, we chose to deploy an additional robustness check to exclude firms that indicate in the survey that a loan is not required.³⁶ In order to test how this choice affects our main results, we examine whether IFRS users requiring finance still receive more financing from foreign sources. Table 8 contains the results. Again, all our previously presented results remain unchanged.

<<<<<Insert Table 8 about here>>>>>

6.4. The Role of Auditing

We ran analyses comparing firms that used audited financial statements with firms that did not carry out external audits. The auditors' report explains which standards are followed (GAAP or IFRS) and provides assurance to debt providers that the firm's implementation of IFRS is trustworthy. In addition, in the sample of firms with audited financial statements, it should be of less concern that some firms that have only applied IFRS selectively should remain undetected (Nobes, 2010). Consistent with prior research (Hope et al., 2011), Table 9 shows that our main results are largely driven by firms with audited financial statements.³⁷ In the subsample of firms without audited financial statements, we find no significant differences between firms that use IFRS and firms that solely use local GAAP. This suggests that IFRS standards are particularly useful if their usage is backed by credible commitment.

<<<<<Insert Table 9 about here>>>>>

³⁶ Other reasons include: interest rates are too high, collateral requirements for bank loans are too strict, application procedures for a bank loan are too burdensome, informal payments to get a bank loan are required, and belief on the part of the manager that the loan deal would not be approved.

³⁷ As an additional test, we calculate the Rosenbaum bounds for the subsample of firms with audited financial statements in countries with high enforcement. For this subsample, we find a critical point of $\Gamma = 2.10$.

6.4. Additional Robustness Checks

Table 10 presents several additional tests that serve to validate our results. First, we check if different treatment effects exist between countries that allowed IFRS for statutory purposes compared to countries where such usage was not permitted. Panel A of Table 10 demonstrates that this difference is negligible. Another potential concern is that IFRS users receive better access to foreign debt but the conditions underpinning receipt of those additional funds differ for firms that solely use local GAAP. Therefore, in a subsequent step, we considered a subset of firms for which more detailed data on the most recent loan a firm received is available. We know the interest rate for each loan, the collateral requirements, the duration of the loan in months, and the time period when the loan was received. Panel B of Table 10 shows descriptively that firms operating in high enforcement countries have lower interest rates, less collateral requirements, and longer loan maturity compared to firms operating in low enforcement countries. However, no statistically significant differences exist between IFRS and local GAAP users with regard to these additional outcome variables in both high and low enforcement countries. Unfortunately, the detailed data on loan characteristics does not differentiate between loans received from domestic banks and from foreign banks. We are, therefore, unable to establish whether the characteristics of foreign loans are different from those of domestic loans.

To test the sensitivity of our analyses with regard to leverage, we re-run all estimations including the interest rate, collateral requirements, loan maturity, and the period of time when the loan was received as additional matching criteria. As an alternative proxy for performance, we use sales minus costs of goods sold divided by the replacement value of the physical production assets. Although the sample size reduces considerably due to data availability, Panel C shows that our results remain robust to these additional controls.

Finally, we perform an alternative matching procedure. We use a caliper matching method without replacement following Cochran and Rubin (1973). This method is similar to the nearest neighbor matching method described in Section 4.1, but it adds an additional restriction in selecting only controls within a certain distance. Firms are then matched to closer (more comparable) control firms. The downside to this approach is that a lower number of matched firms is often the outcome. Our results for a 0.10 caliper cutoff proved to be robust and are presented in Panel D.³⁸

<<<<<Insert Table 10 about here>>>>>

6.5. Remaining Limitations

Before drawing our conclusions, we think it is worthwhile to discuss some limitations present in our study. First, the BEEPS survey is focused on factors affecting the operations and growth of private firms but not their financial reporting strategies. This limits the precision of the IFRS variable. For instance, we cannot rule out the possibility that some firms that claim to use IFRS have merely sought guidance on a very limited number of IFRS standards to inform specific aspects of their financial reporting. In short, some IFRS users may have been selective in applying only a few IFRS standards. This is less of a concern, however, in the subsample of countries where enforcement is high or in firms with an audited financial statement. The auditors' report explains which standards are followed (GAAP or IFRS), ruling out any chance of using IFRS selectively to mislead debt providers. For the group of audited firms, the use of IFRS is more likely to encompass full IFRS adoption (Nobes, 2010). Since our results hold when restricting the sample to audited firms, the potential for heterogeneous use of IFRS may not be a major caveat.

In addition, the national rules of some countries under consideration did not allow private firms to adopt IFRS for consolidated or unconsolidated accounts at the time they were

³⁸ Statistically, the same results are obtained for the cut-off points of 0.05 and 0.15.

observed. However, firms still used IFRS through either dual reporting or reconsolidation (World Bank, 2015a). As previously stated, we are unable to detect these different types of IFRS user in the sample. Some firms may have indicated that they use IFRS yet used these standards solely to construct non-statutory financial statements. It is not clear if these statements are subject to enforcement and/or external audit. While this might pose a major caveat, comparing countries that either permitted or did not permit IFRS adoption reveals very similar results. In any case, if the IFRS variable captures some firms that selectively use IFRS amid others that fully adopt IFRS, our estimated effects would likely be downward biased.

A third issue concerns the notion that IFRS usage could be driven by private firms' incentives to increase their reporting quality rather than by IFRS itself (Christensen et al., 2015; Daske et al., 2013). These managerial incentives are correlated with IFRS usage and could therefore act as drivers of the documented associations. Moreover, the use of IFRS could be demanded by specific lenders or business partners, and potentially be confounded by firms that apply for loans. In this case, the use of IFRS may be correlated with the degree to which a firm is exposed to specific financial institutions or businesses. Rosenbaum bounds suggest that the control variables included in the matching exercise capture most of the unobserved variation. However, in the absence of specific information on external demand factors, we need to recognize that our results may well be overestimated. In this respect, the unavailability of panel data precludes us from using alternative estimation methods, such as a conditional difference-in-difference estimator or a regression discontinuity design that would improve identification. Our approach can only control for observable sources of selection or sources of endogeneity that are strongly correlated with those observables. While we control for the most relevant criteria identified in the literature, which is confirmed by Rosenbaum bound analyses, a cautious interpretation is nonetheless warranted.

7. Conclusion

This study provides evidence of how IFRS usage is related to private firms' ability to attract debt from domestic and foreign banks. Based on comparable firm-level data from 25 countries in Europe and Asia, we show that private firms using IFRS are associated with a higher propensity to attract loans from foreign banks in order to finance new fixed investments. No such association is found for loans provided by domestic banks. The evidence suggests that firms voluntarily using IFRS are associated with an improvement in accounting quality (Christensen et al., 2015), allowing non-relationship lenders to better assess a firm's creditworthiness. International banks are known to use 'hard' information such as financial statements to determine a borrower's credit quality because 'soft' information is not available or is too costly to process (Beck & Demirguc-Kunt, 2006; Berger & Udell, 2006). Domestic banks in the countries under consideration often use various private channels of information, which accounts for the missing evidence that the use of IFRS improves private firms' propensity to attract debt from domestic capital providers. It should be noted that descriptive statistics support a positive association between IFRS usage and domestic bank financing but that this positive association disappears once we control for various well-documented sources of self-selection into IFRS usage.

As it currently stands, mainly large and internationally active private firms use IFRS voluntarily. A large proportion of private firms do not voluntarily opt for IFRS, most likely because the individual costs outweigh the benefits of using these standards. Our results indicate that, conditional on adequate enforcement, the benefits of IFRS usage come from higher propensities to attract debt from foreign banks. How large these benefits actually are and whether these benefits outweigh the costs of IFRS adoption must be answered for each firm individually. The present study has focused on firms that are perceived to have strong incentives to use IFRS (i.e. voluntary IFRS users). Whether the results hold for firms with weaker incentives will need to be determined by future research.

The documented associations may also differ for firms that fully adopt IFRS (i.e. its full application in financial statements) compared to firms that make only selective use of some standards (see e.g., Daske et al. (2013) and Christensen et al. (2015) for a discussion on ‘heterogeneous IFRS adopters’). Once richer datasets for private firms become available, future research will be positioned to investigate how the costs and benefits vary with the differences in IFRS implementation. Future research could add valuable new insights by unraveling the exact mechanisms through which the use of IFRS by private firms influences their ability to attract foreign debt. We argue that those mechanisms are a combination of the provision of higher quality information concerning a firm’s financial situation and enhanced firm comparability. As the latter is probably more important for foreign non-relationship lenders, further insights could be added by examining differences between domestic relationship lenders and domestic non-relationship lenders. Finally, altering the perspective to consider how IFRS accounting actually assists financial institutions in assessing a firm’s creditworthiness would help a great deal to advance our understanding.

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Table 1. Sample Distribution, Regulatory Quality, and Effective Date of IFRS adoption

Country	Observations in Sample	Percentage of IFRS Users	Regulatory Quality 2003 (index)	Adoption of IFRS (Effective date)	Country Specific Rules for Non-Listed Firms on The Adoption of IFRS in Consolidated (C) and in Unconsolidated (U) Annual Accounts
Albania	76	11.84%	-0.469	2008	C + U is required for large entities
Armenia	182	36.26%	0.175	2011	C + U is required for all entities, except micro entities
Bosnia and Herzegovina	12	16.67%	-0.479	2006	C + U is required for all entities
Czech Republic	99	7.07%	1.184	2002	C is permitted for all entities; U permitted for members of a group which use IFRS to prepare C
Estonia	39	84.62%	1.318	2003	C + U is permitted for all entities
Germany	794	10.33%	1.511	2004	U is permitted for all entities, but for information purpose only; from 2003 onwards, C is allowed
Greece	154	7.14%	0.998	2004	C + U is permitted for entities which are audited by certified auditors
Hungary	189	12.70%	1.118	2005	C is permitted for all entities; U is permitted, in addition to required national GAAP
Kazakhstan	145	6.90%	-0.476	2006	C + U is required for public interest entities
Kyrgyz Republic	47	36.17%	-0.409	2009	C + U is required for all entities
Latvia	37	21.62%	0.956	2005	C is permitted for all entities
Lithuania	66	21.21%	1.039	2008	C + U is permitted for all entities
Macedonia	40	17.50%	-0.187	2010	C + U is required for all entities
Moldova	57	12.28%	-0.472	2011	C + U is permitted for all entities
Poland	353	4.25%	0.717	2005	C + U is permitted for entities that have applied for public listing or whose parent uses IFRS
Portugal	88	12.50%	1.226	2006	C is permitted for all entities. U is permitted for members of a group which use IFRS to prepare C
Romania	199	21.61%	-0.072	2007	C+ U is permitted for all entities, but for information purpose only
Russia	130	3.08%	-0.183	2012	C is required for entities who are obliged by federal laws or constitutive documents
Slovak Republic	19	5.26%	0.956	2006	C + U is required for public interest entities
Slovenia	65	13.85%	0.867	2005	C + U is permitted for all entities
South Korea	45	22.22%	0.749	2011	C + U is permitted for all entities
Tajikistan	56	3.57%	-1.12	2007	C + U is required for all entities
Turkey	86	9.30%	0.031	2008	C is required for public interest entities, C is permitted for others
Ukraine	140	12.14%	-0.562	2011	C + U is permitted for all entities
Vietnam	359	0.84%	-0.559	NA	prohibited for all entities
Total	3,477	12.08%	0.314		

Note: We use data from the third wave of the BEEPS survey, which was carried out between the last quarter of 2004 and the first quarter of 2005 by the EBRD and World Bank. The sample consists of 3,477 firm observations where 12.08% of firms use IFRS. For each country, we present (i) the total number of observations, (ii) the percentage of IFRS users, (iii) the Regulatory Quality index taken from Kaufmann et al. (2009) and measured as of 2003, (iv) the year when private firms are effectively allowed/required to adopt IFRS as the method for financial reporting, (v) and a description that indicates the type of private firm that is allowed or required to adopt IFRS from the effective date onwards. If the description does not state that an entity is required or permitted to adopt IFRS, these entities are prohibited from adopting IFRS for official purposes. C stands for the adoption of IFRS in consolidated financial statements and U for the adoption of IFRS in unconsolidated financial statements. These requirements exclude financial entities, investment funds, insurance companies, private pension funds, and entities whose shares are traded on the stock exchange (ROSC from the World Bank, ifrs.org, IAS+, and PWC).

Table 2. Variable Definitions

Variable Name	Variable Description
<i>Panel A: Treatment Indicator</i>	
IFRS	Dummy variable that equals 1 if the firm uses International Financial Reporting Standards. It equals 0 if the firm solely used local GAAP. The question included in the survey was: "Does your firm use international accounting standards (IAS) as provided by the International Accounting Standards Board or US GAAP or national accounting standards as provided by the Ministry of Finance or securities regulator?" Firms could answer Yes or No on each of the three standards.
<i>Panel B: Outcome Variables</i>	
Access to Domestic Loans	Dummy variable that equals 1 if the firm borrowed from domestic banks to finance new fixed investments over the last 12 months, 0 otherwise.
Domestic Loans (%)	The proportion of new fixed investments that are financed by domestic loans over the last 12 months.
Access to Foreign Loans	Dummy variable that equals 1 if the firm borrowed from foreign banks to finance new fixed investments over the last 12 months, 0 otherwise.
Foreign Loans (%)	The proportion of new fixed investments that are financed by foreign loans over the last 12 months.
<i>Panel C: Matching Criteria</i>	
Employees	Number of Employees in $t-3$.
Age	Age of the firm.
Group	Dummy variable that equals 1 if the firm is part of a group, 0 otherwise.
Internal Sales	Proportion of the firm's sales to the parent company or affiliated subsidiaries.
Foreign	Proportion of the firm that is owned by a private foreign individual or foreign company.
Import	Proportion of the firm's material inputs and supplies that are imported.
Export	Proportion of the firm's sales that are exported.
Blockholder	Proportion of shares that is owned by the largest shareholder(s).
Productivity	Productivity measured by sales in $t-3$ divided by employees in $t-3$ and then scaled by the average productivity in $t-3$ of the same industry in a given country.
Sales growth	Growth of sales over the last three years.
Internal funds	Proportion of a firm's working capital that is financed by internal funds and retained earnings.
Human capital	Proportion of employees with a university degree.
R&D	Dummy variable that equals 1 if the firm was engaged in Research & Development, 0 otherwise.
New product	Dummy variable that equals 1 if the firm introduced a new product within the last three years, 0 otherwise:
<i>Panel D: Additional Variables</i>	
Regulatory Quality	We proxy for enforcement quality of countries by using the regulatory quality measure of Kaufmann et al. (2009). The estimated regulatory quality score ranges from approximately 2.5 (strong) to -2.5 (weak). We classify countries above zero as strong enforcement regimes; countries that score below 0 are classified as weak enforcement regimes.
Auditor	Dummy variable equal to 1 if a firm has its financial statements checked and certified by an external auditor, 0 otherwise.
Performance	Sales minus cost of goods sold divided by the replacement value of the physical production assets owned and used by your firm (land, buildings, and equipment).
Loan interest	The annual costs of the most recently obtained bank loan (i.e. rate of interest).
Collateral required	Dummy variable equal to 1 if the most recent loan requires collateral, 0 otherwise.
Loan maturity	The duration of the loan in months.
Time Loan Received	Number of years since the loan was received.

Note: Table 2 presents the definitions of the variables that we use in the analyses.

Table 3. Descriptive Statistics and Matching Results

Variables	Unmatched Sample					Matched Sample		
	IFRS Firms N: 417		Local GAAP Firms N: 3,057		Test for Differences	Local GAAP Firms N: 417		Test for Differences
	Mean	Std. Dev.	Mean	Std. Dev.	p-value	Mean	Std. Dev.	p-value
Matching Criteria								
Employees	143.504	332.963	55.938	201.541	p < 0.001	169.463	405.548	p = 0.462
Age	18.516	19.674	14.551	14.596	p < 0.001	20.794	24.428	p = 0.281
Group	0.257	0.437	0.082	0.274	p < 0.001	0.261	0.44	p = 0.905
Internal Sales	6.376	18.844	1.521	9.737	p < 0.001	5.086	17.28	p = 0.426
Foreign	19.137	34.623	5.864	21.749	p < 0.001	19.305	36.557	p = 0.959
Import	39.434	37.871	23.561	33.999	p < 0.001	35.427	37.106	p = 0.240
Export	17.803	28.051	6.055	17.742	p < 0.001	18.228	28.964	p = 0.871
Blockholder	69.369	29.165	77.045	27.947	p < 0.001	72.046	28.861	p = 0.311
Productivity	1.089	0.808	0.995	1.084	p = 0.029	1.004	0.953	p = 0.306
Sales growth	0.13	0.308	0.111	0.345	p = 0.252	0.136	0.405	p = 0.858
Internal funds	60.544	36.71	64.922	37.678	p = 0.025	58.688	36.519	p = 0.578
Human capital	23.379	24.436	18.992	24.706	p < 0.001	24.141	26.705	p = 0.749
R&D	0.348	0.477	0.127	0.333	p < 0.001	0.365	0.482	p = 0.702
New product	0.494	0.501	0.296	0.457	p < 0.001	0.487	0.5	p = 0.875
Outcome Variables								
Access to Domestic Loans	0.331	0.471	0.241	0.428	p < 0.001	0.309	0.463	p = 0.611
Domestic Loans (%)	14.612	25.675	12.118	26.214	p = 0.074	13.597	25.846	p = 0.667
Access to Foreign Loans	0.096	0.295	0.023	0.149	p < 0.001	0.053	0.224	p = 0.055
Foreign Loans (%)	4.329	16.718	1.107	8.825	p < 0.001	2.23	11.831	p = 0.087

Note: Table 3 presents the results for the unmatched and matched samples. The matched sample is obtained using propensity score matching. In the unmatched sample, we report p-values of two-sided t-tests on mean equality between firms that use IFRS and firms from the potential control group (i.e. all firms that only use local GAAP). In the matched sample, we report p-values of two-sided t-tests on mean equality between firms that use IFRS and a selected control group of firms following the matching procedure described in Section 4.1. Thirteen industry dummies and twenty-five country dummies are not reported. The selected controls are selected from the same country as the matched pair. The matched sample is also balanced over industries after matching. The reported p-values for the matched sample account for sampling with replacement (Lechner, 2001). Three firms drop out to satisfy the common support restriction. See Table 2 for variable definitions.

Table 4. Matching Results: High vs Low Enforcement

Variables	Countries with High Enforcement					Countries with Low Enforcement				
	IFRS Firms N: 296		Local GAAP Firms N: 296		Test for Differences	IFRS Firms N: 121		Local GAAP Firms N: 121		Test for Differences
	Mean	Std. Dev.	Mean	Std. Dev.	p-value	Mean	Std. Dev.	Mean	Std. Dev.	p-value
Matching Criteria										
Employees	156.929	368.637	145.115	308.74	p = 0.759	110.661	220.741	107.884	354.359	p = 0.952
Age	19.517	20.78	18.53	19.869	p = 0.679	16.066	16.485	15.579	15.685	p = 0.837
Group	0.28	0.45	0.291	0.455	p = 0.851	0.198	0.4	0.149	0.357	p = 0.370
Internal Sales	7.057	19.536	6.145	18.759	p = 0.685	4.711	16.996	4.603	17.81	p = 0.967
Foreign	19.378	34.287	18.375	36.534	p = 0.814	18.545	35.57	19.694	36.771	p = 0.831
Import	38.909	36.39	35.716	37.261	p = 0.467	40.719	41.401	46.017	42.06	p = 0.391
Export	18.622	27.266	16.122	28.718	p = 0.457	15.802	29.908	12.529	28.178	p = 0.443
Blockholder	67.128	28.795	62.564	28.576	p = 0.179	74.851	29.458	79.678	26.516	p = 0.238
Productivity	1.115	0.828	0.993	0.845	p = 0.222	1.025	0.756	0.896	0.991	p = 0.337
Sales growth	0.094	0.222	0.089	0.324	p = 0.904	0.219	0.443	0.197	0.414	p = 0.730
Internal funds	55.814	36.182	53.328	35.846	p = 0.559	72.116	35.545	75.942	35.621	p = 0.467
Human capital	21.912	23.642	23.554	26.386	p = 0.591	26.967	26.03	28.372	26.371	p = 0.717
R&D	0.385	0.487	0.351	0.478	p = 0.553	0.256	0.438	0.223	0.418	p = 0.600
New product	0.497	0.501	0.473	0.5	p = 0.690	0.488	0.502	0.496	0.502	p = 0.911
Outcome Variables										
Access to Domestic Loans	0.385	0.487	0.399	0.49	p = 0.816	0.198	0.4	0.231	0.423	p = 0.590
Domestic Loans (%)	16.899	26.411	20.294	29.588	p = 0.321	9.017	22.935	11.339	25.721	p = 0.525
Access to Foreign Loans	0.118	0.323	0.014	0.116	p < 0.001	0.041	0.2	0.033	0.18	p = 0.766
Foreign Loans (%)	4.78	16.551	0.456	4.858	p < 0.001	3.223	17.137	2.727	15.811	p = 0.837

Note: Table 4 presents the results for the matched subsamples of high enforcement and low enforcement countries. The matched samples are obtained using propensity score matching. Countries are placed in the high (low) enforcement subsample if the regulatory quality index of Kaufmann et al. (2009) is higher (lower) than zero. We report p-values of two-sided t-tests on mean equality between firms that use IFRS and the selected control group of firms following the matching procedure described in Section 4.1. The selected controls are chosen from the same country as the matched pair. Both subsamples are balanced over industries after matching. The reported p-values for the matched sample account for sampling with replacement (Lechner, 2001). All firms satisfy the common support restriction in the subsample of countries with low enforcement. Three firms drop out to satisfy the common support restriction in the subsample of countries with high enforcement. See Table 2 for variable definitions.

Table 5. Summary of Treatment Effects and Tests for Differences Between Groups

	Countries with High Enforcement	Countries with Low Enforcement	Tests for Differences: High vs Low Enforcement
	N: 296	N: 121	
Outcome Variables	Average Treatment Effect	Average Treatment Effect	Treatment Effect <small>high enf.</small> = Treatment Effect <small>low enf.</small>
Access to Domestic Loans	-0.014	-0.033	p = 0.788
Domestic Loans (%)	-3.395	-2.322	p = 0.801
Access to Foreign Loans	0.105***	0.008	p = 0.005
Foreign Loans (%)	4.324***	0.496	p = 0.061
Tests for differences: Domestic vs Foreign Loans			
Treatment Effect <small>Access to domestic Loans</small> = Treatment Effect <small>Access to foreign Loans</small>	p = 0.008	p = 0.517	
Treatment Effect <small>Domestic Loans (%)</small> = Treatment Effect <small>Foreign Loans (%)</small>	p = 0.003	p = 0.513	

Note: Table 5 summarizes the average treatment effect of IFRS usage for the subsamples of high and low enforcement countries. The treatment effects are equal to the difference in the average of the outcome variable of the treated firms and the non-treated firms found in Table 4. ***, **, and * indicate significance at the 1%, 5% and 10% levels, respectively. The column that presents the tests for differences between high and low enforcement countries reports p-values of two-sided unpaired t-tests on mean equality between the treatment effects found in the high and low enforcement sample. The row that presents the tests for differences between domestic and foreign loans reports p-values of two-sided t-tests on mean equality between the treatment effects found for foreign and domestic loans. See Table 2 for variable definitions.

Table 6. Rosenbaum Bounds – Unobserved Factors on Access to Foreign Loans

Γ	$Q^+(MH)$	$Q^-(MH)$	p-value
1	4.96615	4.96615	$p < 0.001$
...			
4.25	1.4005	10.7973	$p = 0.0807$
4.30	1.3762	10.8604	$p = 0.0844$
4.35	1.3523	10.9232	$p = 0.0881$
4.40	1.3286	10.9856	$p = 0.0920$
4.45	1.3052	11.0475	$p = 0.0959$
4.50	1.2822	11.1091	$p = \mathbf{0.0999}$
4.55	1.2594	11.1704	$p = 0.1039$
4.60	1.2369	11.2313	$p = 0.1081$
4.65	1.2147	11.2918	$p = 0.1122$
4.70	1.1927	11.3520	$p = 0.1165$
4.75	1.1710	11.4118	$p = 0.1208$
...			

Note: Table 6 reports Rosenbaum bounds for the treatment effect of IFRS usage on ‘Access to Foreign Loans’ for the subsample of high enforcement countries. The Rosenbaum bounds give an indication of when our results would become insignificant if we faced a certain level of positive or negative unobserved selection bias. When no (unobserved) bias exist ($\Gamma = 1$), the Mantel-Haenszel test-statistic of $Q^+(MH) = Q^-(MH) = 4.96615$ confirms that there is a significant impact of IFRS usage on ‘Access to Foreign Loans’. Column 1 shows the odds (Γ) of selection bias due to unobserved factors, which we gradually increase. Column 2 and Column 3 display the Mantel-Haenszel test statistic with the assumption of over-estimation $Q^+(MH)$ and under-estimation $Q^-(MH)$ of the treatment effect, respectively. In Column 4, we translate the Mantel-Haenszel test statistic with the assumption of over-estimation to the associated p-values. P-values for under-estimation are not reported. In the case of an underestimation of the treatment effect, the effect is significant under $\Gamma = 1$ and becomes even more significant for increasing values of Γ . The critical gamma appears in bold. P-values lower than 0.10 indicate that the outcome variables are insensitive to unobserved selection biases. The critical Γ is 3.7 at the 5% significance level, and 2.8 at the 1% level. See Table 2 for variable definitions.

Table 7. Excluding Countries with a High Percentage of IFRS Users

Panel A: All Countries						
	IFRS Firms		Local GAAP Firms			
	N: 227		N: 227			
Outcome Variables	Mean		Mean			p-value
Access to Domestic Loans	0.302		0.378			p = 0.148
Domestic Loans (%)	13.253		17.271			p = 0.176
Access to Foreign Loans	0.111		0.036			p = 0.004
Foreign Loans (%)	4.844		1.244			p = 0.008

Panel B: High vs Low Enforcement Countries						
	High Enforcement Countries			Low Enforcement Countries		
	IFRS Firms	Local GAAP Firms		IFRS Firms	Local GAAP Firms	
	N: 166	N: 166		N: 61	N: 61	
Outcome Variables	Mean	Mean	p-value	Mean	Mean	p-value
Access to Domestic Loans	0.337	0.398	p = 0.342	0.213	0.164	p = 0.540
Domestic Loans (%)	15.072	17.681	p = 0.462	9.016	8.934	p = 0.987
Access to Foreign Loans	0.127	0.042	p = 0.012	0.066	0.098	p = 0.572
Foreign Loans (%)	4.819	1.265	p = 0.013	4.754	7.541	p = 0.554

Note: Panel A of Table 7 reports results for the matched sample when we exclude countries where more than 20% of firms indicate that they use IFRS. In Panel B, we split the sample in countries with high and low enforcement. Countries are placed in the high (low) enforcement subsample if the regulatory quality index of Kaufmann et al. (2009) is higher (lower) than zero. The matched samples are obtained using propensity score matching. For each subsample, we present means and p-values of two-sided t-tests on mean equality between firms that use IFRS and firms that solely use local GAAP (after matching). The p-values reported account for sampling with replacement (Lechner, 2001). The same matching criteria are used as those presented in Table 3. The matching criteria do not significantly differ after matching (untabulated). The controls are selected from the same country as the matched pair. In all subsamples, the matched samples are balanced over industries after matching. In the samples used in Panel A, Panel B (HIGH ENF), and Panel B (LOW ENF) respectively, 2, 2, and 0 firms drop out of the sample to satisfy the common support restriction. See Table 2 for variable definitions.

Table 8. Excluding Firms that do not need a Loan

Panel A: All Countries						
	IFRS Firms		Local GAAP Firms		p-value	
	N: 321		N: 321			
Outcome Variables	Mean		Mean			
Access to Domestic Loans	0.421		0.492		p = 0.163	
Domestic Loans (%)	18.592		23.146		p = 0.134	
Access to Foreign Loans	0.115		0.050		p = 0.012	
Foreign Loans (%)	4.969		1.963		p = 0.025	

Panel B: High vs Low Enforcement Countries						
	High Enforcement Countries			Low Enforcement Countries		
	IFRS Firms	Local GAAP Firms		IFRS Firms	Local GAAP Firms	
	N: 226	N: 226		N: 95	N: 95	
Outcome Variables	Mean	Mean	p-value	Mean	Mean	p-value
Access to Domestic Loans	0.491	0.509	p = 0.786	0.253	0.253	p = 1.000
Domestic Loans (%)	21.580	23.589	p = 0.495	11.484	12.842	p = 0.753
Access to Foreign Loans	0.142	0.031	p < 0.001	0.053	0.053	p = 1.000
Foreign Loans (%)	5.332	1.261	p = 0.006	4.105	4.211	p = 0.973

Note: Panel A of Table 8 report results for the matched sample when we exclude firms that indicate that they do not need a loan. For Panel B, we split the sample into countries with high and low enforcement. Countries are in the high (low) enforcement subsample if the regulatory quality index of Kaufmann et al. (2009) is higher (lower) than zero. The matched samples are obtained using propensity score matching as introduced in Section 4.1. For each subsample, we present means and p-values of two-sided t-tests on mean equality between firms that use IFRS and firms that solely use local GAAP (after matching). The p-values reported account for sampling with replacement (Lechner, 2001). The same matching criteria are used as those presented in Table 3. The matching criteria do not significantly differ after matching (untabulated). The controls are selected from the same country as the matched pair. In all subsamples, the matched samples are balanced over industries after matching. All firms satisfy the common support restriction. See Table 2 for variable definitions.

Table 9. Firms with and without an External Auditor

Panel A: Firms with an External Auditor (All Countries)						
	IFRS Firms		Local GAAP Firms			
	N: 258		N: 258			
Outcome Variables	Mean		Mean		p-values	
Access to Domestic Loans	0.360		0.388		p = 0.606	
Domestic Loans (%)	15.391		17.965		p = 0.386	
Access to Foreign Loans	0.105		0.043		p = 0.018	
Foreign Loans (%)	4.109		1.628		p = 0.056	

Panel B: Firms with an External Auditor (High vs Low Enforcement Countries)						
	High Enforcement Countries			Low Enforcement Countries		
	IFRS Firms		Local GAAP Firms	IFRS Firms		Local GAAP Firms
	N: 192		N: 192	N: 71		N: 71
Outcome Variables	Mean	Mean	p-value	Mean	Mean	p-value
Access to Domestic Loans	0.396	0.406	p = 0.870	0.211	0.155	p = 0.744
Domestic Loans (%)	16.380	16.938	p = 0.868	11.070	9.310	p = 0.471
Access to Foreign Loans	0.120	0.031	p = 0.003	0.042	0.113	p = 0.228
Foreign Loans (%)	4.479	0.573	p = 0.001	2.958	8.028	p = 0.271

Panel C: Firms without an External Auditor (All Countries)						
	IFRS Firms		Local GAAP Firms			
	N: 106		N: 106			
Outcome Variables	Mean		Mean		p-values	
Access to Domestic Loans	0.245		0.311		p = 0.321	
Domestic Loans (%)	11.557		13.368		p = 0.612	
Access to Foreign Loans	0.066		0.047		p = 0.577	
Foreign Loans (%)	3.774		1.887		p = 0.349	

Panel D: Firms without an External Auditor (High vs Low Enforcement Countries)						
	High Enforcement Countries			Low Enforcement Countries		
	IFRS Firms		Local GAAP Firms	IFRS Firms		Local GAAP Firms
	N: 56		N: 56	N: 48		N: 48
Outcome Variables	Mean	Mean	p-value	Mean	Mean	p-value
Access to Domestic Loans	0.286	0.340	p = 0.558	0.167	0.125	p = 0.586
Domestic Loans (%)	15.536	14.375	p = 0.819	6.146	5.313	p = 0.816
Access to Foreign Loans	0.089	0.036	p = 0.253	0.042	0.021	p = 0.577
Foreign Loans (%)	3.929	1.071	p = 0.200	3.75	1.042	p = 0.348

Note: In Panel A and Panel C of Table 9, we report results for the matched subsample of firms with or without audited financial statements. In Panel B and Panel D, we split these samples into countries with high and low enforcement. Countries are placed in the high (low) enforcement subsample if the regulatory quality index of Kaufmann et al. (2009) is higher (lower) than zero. The matched samples are obtained using propensity score matching as introduced in Section 4.1. For each subsample, we present means and p-values of two-sided t-tests on mean equality between firms that use IFRS and firms that solely use local GAAP (after matching). The p-values reported account for sampling with replacement (Lechner, 2001). The same matching criteria as those presented in Table 3 are used. The matching criteria do not significantly differ after matching (untabulated). The controls are selected from the same country as a matched pair. In all subsamples, the matched samples are balanced over industries. A caliper matching with a cut-off value of 0.10 is used in the subsample of Panel A and Panel B (HIGH ENF). Our matching criteria are still significantly different in these samples without including the additional caliper restriction. In the samples used in Panel A, Panel B (HIGH ENF), Panel B (LOW ENF), Panel C, Panel D (HIGH ENF) and Panel D (LOW ENF) respectively, 55, 49, 1, 1, 1 and 2 firms drop out to satisfy the common support restriction or caliper restriction. See Table 2 for variable definitions.

Table 10. Additional Robustness Checks

Panel A: Countries that Allowed Adoption vs Countries that Did Not Allow Adoption						
	High Enforcement, Allowed			High enforcement, Not Allowed		
	IFRS Firms	Local GAAP Firms		IFRS Firms	Local GAAP Firms	
	N: 186	N: 186		N:108	N: 108	
Outcome Variables	Mean	Mean	p-value	Mean	Mean	p-value
Access to Domestic Loans	0.339	0.398	p = 0.403	0.463	0.435	p = 0.741
Domestic Loans (%)	16.059	19.806	p = 0.387	18.472	23.472	p = 0.321
Access to Foreign Loans	0.118	0.022	p = 0.007	0.120	0.046	p = 0.084
Foreign Loans (%)	4.839	0.914	p = 0.013	4.768	0.648	p = 0.011

Panel B: Additional Outcome Variables						
	High Enforcement Countries			Low Enforcement Countries		
	IFRS Firms	Local GAAP Firms		IFRS Firms	Local GAAP Firms	
	N: 119	N: 119		N:62	N: 62	
Additional Outcome Variables	Mean	Mean	p-value	Mean	Mean	p-value
Loan Interest	9.782	9.968	p = 0.760	16.408	17.581	p = 0.309
Collateral Required	0.798	0.874	p = 0.115	0.887	0.952	p = 0.188
Loan Maturity	43.983	42.580	p = 0.752	34.129	26.903	p = 0.289
Time Loan Received	3.303	3.059	p = 0.542	1.355	1.274	p = 0.715
Outcome Variables	Mean	Mean	p-value	Mean	Mean	p-value
Access to Domestic Loans	0.571	0.630	p = 0.355	0.371	0.339	p = 0.709
Domestic Loans (%)	26.134	28.092	p = 0.611	16.952	18.790	p = 0.743
Access to Foreign Loans	0.168	0.076	p = 0.028	0.081	0.081	p = 0.880
Foreign Loans (%)	6.008	1.765	p = 0.014	6.290	6.935	p = 1.000

Panel C: Including Additional Controls						
	High Enforcement Countries			Low Enforcement Countries		
	IFRS Firms	Local GAAP Firms		IFRS Firms	Local GAAP Firms	
	N: 165	N: 165		N:43	N: 43	
Outcome Variables	Mean	Mean	p-value	Mean	Mean	p-value
Access to Domestic Loans	0.588	0.582	p = 0.911	0.302	0.442	p = 0.181
Domestic Loans (%)	25.406	25.006	p = 0.847	14.326	22.884	p = 0.202
Access to Foreign Loans	0.188	0.066	p < 0.001	0.116	0.093	p = 0.728
Foreign Loans (%)	6.636	1.697	p < 0.001	9.070	8.837	p = 0.969

Panel D: Caliper Matching Results without Replacement with Cut-off Point 0.10						
	High Enforcement Countries			Low Enforcement Countries		
	IFRS Firms	Local GAAP Firms		IFRS Firms	Local GAAP Firms	
	N: 218	N: 218		N: 109	N: 109	
Outcome Variables	Mean	Mean	p-value	Mean	Mean	p-value
Access to Domestic Loans	0.381	0.431	p = 0.284	0.211	0.174	p = 0.494
Domestic Loans (%)	16.789	20.307	p = 0.180	9.826	8.826	p = 0.756
Access to Foreign Loans	0.106	0.037	p = 0.005	0.037	0.046	p = 0.735
Foreign Loans (%)	4.404	1.353	p = 0.016	2.661	3.211	p = 0.801

Note: Table 10 reports our results for the matched sample of various robustness checks. In Panel A, we report results on the subsample of countries with high enforcement that either allowed or did not allow IFRS adoption for private firms. Panel B reports results on the matched sample including additional outcome variables: Loan Interest, Collateral Required, Loan Maturity, and Time Loan Received. Panel C reports results on the matched sample when we include additional matching criteria: Performance, Loan Interest, Collateral Required, Loan Maturity, and Time Loan Received. Panel D reports results on the matched sample when we use a different matching protocol: caliper matching without replacement with a cut-off point of 0.10. For each panel, we report the means and p-values of two-sided t-tests on mean equality for firms that use IFRS and firms that solely use local GAAP (after matching). The p-values reported account for sampling with replacement, except in Panel D where we match without replacement (Lechner, 2001). The same matching criteria are used as those presented in Table 3. The matching criteria do not significantly differ after matching (untabulated). The controls are selected from the same country as the matched pair. In all subsamples, the matched samples are balanced over industries after matching. A caliper matching with a cut off 0.05 was used in the subsample of panel B (HIGH ENF). Our matching criteria are still significantly different in this sample without including the additional caliper restriction. In the samples used in Panel A (ALLOWED), Panel A (NOT ALLOWED), Panel B (HIGH ENF), Panel B (LOW ENF), Panel C (HIGH ENF), Panel C (LOW ENF), Panel D (HIGH ENF) and Panel D (LOW ENF) respectively, 3, 2, 74, 0, 7, 2, 81 and 12 firms drop out the sample to satisfy the common support restriction or additional caliper restriction. See Table 2 for variable definitions.

FACULTY OF ECONOMICS AND BUSINESS
DEPARTMENT OF MANAGERIAL ECONOMICS, STRATEGY AND INNOVATION

Naamsestraat 69 bus 3500
3000 LEUVEN, BELGIË
tel. + 32 16 32 67 00
fax + 32 16 32 67 32
info@econ.kuleuven.be
www.econ.kuleuven.be/MSI

