



ELSEVIER

Contents lists available at ScienceDirect

## Journal of Accounting and Public Policy

journal homepage: [www.elsevier.com/locate/jaccpubpol](http://www.elsevier.com/locate/jaccpubpol)

Full length article

Product market effects of IFRS adoption<sup>☆</sup>Jimmy F. Downes<sup>a</sup>, Vanessa Flagmeier<sup>b</sup>, David Godsell<sup>c,\*</sup><sup>a</sup> University of Nebraska-Lincoln, College of Business, P.O. Box 880488, Lincoln, NE 68588-0488, USA<sup>b</sup> University of Paderborn, Chair for Taxation and Accounting, Warburger Str. 100, 33098 Paderborn, Germany<sup>c</sup> University of Illinois at Urbana-Champaign, College of Business, Wohlers Hall Suite 396, 1206 South Sixth Street, Champaign, IL 61820, USA

## ARTICLE INFO

## JEL classification:

D43

G32

G38

## Keywords:

Financial reporting regulation

Product market competition

## ABSTRACT

Prior literature finds that International Financial Reporting Standards (IFRS) adopters enjoy lower financing costs subsequent to IFRS adoption. We predict and find that mandatory IFRS adopters exploit lower financing costs to increase market share vis-à-vis non-adopters. This effect is robust across several different model specifications in a sample capturing the universe of public and private firms in the EU, in a matched sample of public and private firms, and in a public firm sample comparing mandatory and voluntary IFRS adopters. We further find that IFRS is associated with an increase (decrease) in industry sales concentration (competition), consistent with large public firms increasing market share. In supplemental analyses, we find that mandatory adopters issue more equity and debt after IFRS adoption and that larger market share gains accrue to those mandatory IFRS adopters that issue more equity and debt after IFRS adoption. Overall, we provide evidence of unintended product market consequences of IFRS adoption.

## 1. Introduction

The purpose of this paper is to examine the association between a change in financial reporting and public firms' market share. We exploit the mandatory adoption of International Financial Reporting Standards (IFRS) and concurrent enforcement changes in the European Union (EU) as an exogenous change in financial reporting for public firms and find that this change is associated with an increase in IFRS firms' market share vis-à-vis non-adopters. Based on evidence that information quality improves access to financing and that firm liquidity affects the product market, we predict and find that public firms' market share increases after IFRS adoption.

Our investigation responds to a call by Leuz and Wysocki (2016, p. 108) to provide "more evidence on the real and indirect effects of disclosure and reporting regulation, for example, with respect to corporate behavior, competition, and innovation." This study also adds to a growing literature on the real effects of financial reporting improvements, which include multinational corporation investment decisions (Shroff et al., 2014), managers' investment efficiency (Loureiro and Taboada, 2015) and investor allocation decisions (DeFond et al., 2012; Lawrence, 2013). Most relevant to our setting is recent evidence highlighting fewer financing frictions for adopting firms following IFRS and concurrent regulatory events (e.g., (Florou and Kosi, 2015; Naranjo et al., 2018).

<sup>☆</sup> We thank Martin Loeb (editor) and the anonymous referees for their valuable comments and suggestions, which helped us improve the paper significantly. We also thank Urška Kosi, Jean-Etienne de Bettignies, Brooke Beyer, Matthew Boland, Matthew Cobabe, Agnes Cheng, Bowe Hansen, Jing Huang, Ole-Kristian Hope, Huafang Liu, Amanda Gonzales, Scott Johnson, Tony Kang, Wayne Landsman, Jens Mueller, Tom Omer, Paul Tanyi, Maria Ivanova Vulcheva (discussant), Michael Welker and workshop participants at the 2013 AAA International Accounting Section Mid-Year Doctoral Consortium, the 2015 AAA Conference and the University of Nebraska-Lincoln for their comments.

\* Corresponding author.

E-mail addresses: [downes@unl.edu](mailto:downes@unl.edu) (J.F. Downes), [vanessa.flagmeier@upb.de](mailto:vanessa.flagmeier@upb.de) (V. Flagmeier), [dgodsell@illinois.edu](mailto:dgodsell@illinois.edu) (D. Godsell).

<https://doi.org/10.1016/j.jaccpubpol.2018.09.004>

0278-4254/ © 2018 Elsevier Inc. All rights reserved.

Financial reporting improvements increase the transparency and comparability of financial statements and reduce information asymmetry between managers and investors, thereby reducing risk for equity and debt holders (Healy and Palepu, 2001). It follows that a change in information asymmetry will lead to a change in the cost of financing for public firms and in public firms' investment policy. That is, in a setting with high information asymmetry, managers hold marginal net present value projects, which could be implemented under lower financing costs. Lower financing costs lead to new investment for financially constrained firms (Krishnan et al., 2014), which leads to increased market share. Bolton and Scharfstein (Bolton and Scharfstein, 1990) argue that firms exogenously endowed with financial resources will engage in predatory behavior and make new investments to gain market share. Therefore, we expect to find an increase in public firms' market share after mandatory IFRS adoption.<sup>1</sup>

To accurately measure market share and industry concentration, we examine the universe of public and private EU firms consisting of 3.7 million firm-year observations from 10 different countries for the period 2000–2010. Our research design is novel because we overcome the common criticism that competition measures fail to include private firms (due to their absence in available databases [e.g., Compustat, Worldscope]). Including private firms allows for improved construct validity and more reliable market share and industry concentration analyses (Ali et al., 2009). That is, we remove measurement error from conventionally constructed Herfindahl Index (HHI) measures using the universe of public and private firm data in the EU.

To test our prediction, we use a sample of both public and private firms and find robust evidence of a positive and economically significant relation between mandatory IFRS adoption and public firms' market share. These results are most pronounced in a subsample excluding public firms identified by Daske et al. (2013) as voluntary adopters and excluding countries that permit the adoption of IFRS prior to 2005 or an adoption deferral (Pownall and Wieczynska, 2018). Our findings are robust to multiple model specifications, to using a matched sample of public and private firms, and to using public voluntary adopters as a control group.

In supplemental analysis, we examine whether the market share changes affect industry competition, measured using the Herfindahl Index. Overall, we find that sales concentration increases in industries with a high percentage of public firms after mandatory IFRS adoption, suggesting a decrease in competition in industries most affected by IFRS. This result corroborates our market share findings and is also consistent with the logic that public firms use the IFRS-related product market advantage to capture market share from private firm industry peers. This evidence also suggests that public firms as a whole, through these product market effects, benefit from the adoption of IFRS at the expense of private firms. Overall, our main findings suggest that public firms' market share increases while industry competition decreases subsequent to mandatory IFRS adoption and concurrent enforcement changes.

Our analysis relies on two assumptions: external financing costs decline and investment levels increase for mandatory IFRS adopters following IFRS adoption. We cannot empirically test the first assumption because cost of capital data is not available for our control group of private firms. We can empirically test the second assumption by measuring changes in equity and debt levels around IFRS adoption. We find that, following mandatory IFRS adoption, adopting firms issue more equity and debt, and those adopters that issue more equity and debt increase market share more. We find corroborating evidence in tests demonstrating an increase in investment efficiency for IFRS adopting firms. Specifically, we find that IFRS adopters use new investment to reduce underinvestment (while we observe no effect on over-investment) following IFRS. This result is consistent with adopting firms deploying new capital to attenuate underinvestment by pursuing positive NPV investment without accentuating overinvestment.

Our study contributes to the literature in several ways. First, we show that an exogenous change to the information environment affects the structure of the product market when the change affects only a subset of the universe of competing firms. This finding is new to the literature examining the unintended consequences of financial reporting changes and enforcement.<sup>2</sup> We find evidence consistent with public firms exploiting the competitive advantage provided by financial reporting changes to increase market share. The potential effects on within-industry wealth transfers between public and private firms are economically important, and our results suggest additional regulator attention to the relation between new regulation and product market competition is warranted. Second, we respond to the aforementioned call by Leuz and Wysocki (2016, p. 108) to provide more evidence on the product market effects of reporting regulations. Third, we add to the literature examining determinants of market share and product market competition (e.g., Alimov, 2016; Campello, 2006; Fresard, 2010; He and Huang, forthcoming). Competition is viewed as a critical component of a smoothly functioning market economy, and, as such, our evidence points to the need for regulators to consider the effects of financial reporting changes within a larger economic framework intended to support a smoothly functioning market economy. In doing so, we provide a concrete example of the tension in “the reality that regulation of corporate reporting is just one piece of a larger regulatory configuration ... [but that] care must be taken not to undermine the primary role of financial accounting information in promoting corporate transparency to support market discipline and capital allocation” (Bushman and Landsman, 2010, p. 260).

## 2. Related literature and hypotheses development

In this section, we develop our hypotheses by examining the two linkages underpinning our prediction that the change in financial reporting affects competitive behaviors between public and private firms. First, we examine the link between the properties of

<sup>1</sup> While evidence on whether the mandatory IFRS adoption increases reporting quality is mixed (see Leuz and Wysocki, 2016), there is broad consensus in the literature on a reduction in financing costs around mandatory IFRS adoption (see Section 2 for our discussion of this literature).

<sup>2</sup> Bruggemann et al. (2013) survey this literature. An unintended consequence is a consequence that “cannot be reconciled with the IAS Regulation's stated objectives” (Bruggemann et al., 2013, p. 2).

mandatory financial reporting and the costs and level of equity and debt financing. Second, we examine the link between financing and competition.<sup>3</sup> We conclude this section by presenting our hypotheses.

### 2.1. Financial reporting regulation effects on financing level and costs

All firms listed in EU-regulated markets must prepare their consolidated statements in accordance with IFRS for fiscal years beginning January 1, 2005 (Regulation [EC] No. 1606/2002). Concurrent with the mandatory IFRS adoption, a number of countries increase enforcement of accounting regulations (Christensen et al., 2013; Daske et al., 2008). Some of these institutional changes are tied to IFRS adoption while others apply to publicly listed firms more generally. In the EU, five countries (Finland, Germany, the Netherlands, Norway, and the U.K.) make substantive enforcement changes concurrent with IFRS adoption (Christensen et al., 2013). Examples of the changes include the creation of new enforcement agencies or the tightening of penalties for the violation of accounting standards. The mandatory adoption of IFRS, together with the enforcement changes in the EU, is an exogenous change in financial reporting.<sup>4</sup> We expect this change to affect public firms' market share based on the following theoretical framework.

Firms' information environments affect the cost of capital and level of investment (Bushman and Smith, 2001). In a neoclassical setting, growth opportunities are known to investors, and these opportunities solely determine investment policy (Jorgensen and Siebert, 1968). Our setting, however, is characterized by information asymmetries giving rise to agency costs, which add financing friction to the neoclassical framework. Information theories suggest that capital providers are sensitive to agency costs (Diamond, 1989; Jaffee and Russell, 1976; Stiglitz and Weiss, 1981), and Bushman and Smith (2001) describe three channels through which information asymmetry, which gives rise to agency costs, may affect the cost of capital and level of investment. First, information symmetry facilitates investors' investment selection process, which attracts more and cheaper capital to the capital markets. Information asymmetry, in contrast, weakens the ability of debtholders to evaluate the *ex ante* and *ex post* merits of a project or firm, giving greater latitude for the incursion of agency costs, thereby heightening investor risk. Second, information symmetry facilitates the stewardship of resources by enabling the monitoring of management performance. Greater information asymmetry, in contrast, increases the risk of moral hazard and weakens firm governance by directors and shareholders. Third, information symmetry reduces the adverse selection problem among investors. Overall, information asymmetry gives rise to moral hazard and adverse selection problems, which adversely affect the cost and level of capital available to the firm. We discuss equity and debt holders separately as they are subject to different incentives. However, the literature indicates that an improvement in information symmetry reduces agency conflicts for both.<sup>5</sup>

#### 2.1.1. Equity financing costs

The basic relation between information asymmetry and cost of equity predates IFRS adoption and is motivated by several theoretical studies (e.g., (Dye, 1990; Easley and O'Hara, 2004; Lambert et al., 2007; Verrecchia, 2001). Information asymmetries can lead to an increase in the bid–ask spread and reduce the liquidity of the capital market (Welker, 1995). The resulting increase in cost of equity capital can be mitigated by higher-quality financial reporting. Empirical evidence supports the link between financial reporting quality and financing cost (Healy and Palepu, 2001; Li, 2010; and Leuz and Wysocki, 2016) review the literature on disclosure and cost of equity capital).

The adoption of IFRS was intended to improve accounting quality by increasing transparency and comparability of financial statements (Regulation [EC] No. 1606/2002, Article 1). Evidence on the effect of the mandatory IFRS adoption on reporting quality is mixed (Leuz and Wysocki, 2016). For example, Jeanjean and Stolowy (Jeanjean and Stolowy, 2008) provide evidence of no decline in earnings management following IFRS adoption within Austria and the U.K. but find an increase in France. Doukakis (2014) also provides evidence of no change in either accruals or real earnings management following IFRS, suggesting that firm-level incentives

<sup>3</sup> A proximate but distinct literature examines the direct effect of voluntary disclosures on firms' competitive product market behavior (e.g., Verrecchia, 1983; Darrrough, 1993). The mechanism we examine is distinct because changes in financial reporting around IFRS are mandatory rather than a voluntary corporate action motivated by competitive and strategic intentions in the product market. As stated by Berger and Hann (2007), "...as opposed to a voluntary increase in disclosure, a mandated increase is less likely to impose a net proprietary cost on a firm. With a mandated increase, a firm benefits from the enhanced disclosures of its competitors at the same time that it is harmed by its own disclosure increase." In our setting, any proprietary costs of disclosure caused by IFRS affect all public firms that already have high disclosures vis-à-vis the group of private firms unaffected by mandatory IFRS-related financial reporting. Consequently, the proprietary costs of additional IFRS-related disclosures are likely lower than in settings in which a subset of, rather than all, public firms are compelled to provide additional disclosures (e.g., U.S. firm segment reporting after SFAS 131 [Botosan and Stanford, 2005]). Overall, the voluntary and mandatory disclosure literatures remain distinct if mandatory disclosures do not systematically affect voluntary disclosures and if mandatory disclosures affecting all public firms do not materially affect the proprietary costs of disclosure.

<sup>4</sup> While the conditions of the IFRS adoption could, to some degree, be modified by the countries' governments (e.g., adoption deferral or early adoption, see e.g. Ramanna and Sletten, 2014), the adoption is an exogenous event for the respective firms.

<sup>5</sup> In the presence of unmitigated agency costs, there are several reasons to expect that debt and equity investors will be dissuaded from allocating resources to the firm. For example, management with excessive perquisite consumption will raise firm operating expenses as a proportion of sales, thereby leading to increased agency costs; managers may indulge in costly empire-building, which increases assets and sales but reduces profits (Hope and Thomas, 2008), or the inverse may occur—severer asymmetric cost-stickiness, a phenomenon in which managers reduce costs more slowly than they raise costs in the presence of a change in sales (Anderson et al., 2003); and equity and debt holders may also be deterred by managers who may use information asymmetry to indulge in the quiet life (Bertrand and Mullainathan, 2003).

make a bigger difference than reporting incentives. [Atwood et al. \(2011\)](#) provide evidence that earnings under IFRS are no more or less persistent compared to earnings reported under local GAAP. When compared to U.S. GAAP, [Lin et al. \(2012\)](#) use a sample of German firms and provide evidence that IFRS resulted in greater earnings management, less timely loss recognition and less value relevance. However, a considerable number of studies indicates positive capital-market consequences around the adoption (e.g., [Daske et al., 2008](#); [Li, 2010](#)).<sup>6</sup> Several studies document that these effects are concentrated in countries with strong legal enforcement (e.g., [Daske et al., 2008](#); [Florou and Pope, 2012](#); [Landsman et al., 2012](#)) or with enforcement changes that occurred concurrent with the IFRS adoption ([Christensen et al., 2013](#)). In sum, the literature provides broad evidence on the following two points: (1) the cost of equity capital decreases for mandatory IFRS adopters, and (2) the effect seems to be driven by both the new accounting standards and concurrent regulatory changes. We subsume both possible drivers under changes in financial reporting.

### 2.1.2. Debt financing costs

[Armstrong et al. \(2010\)](#) review the literature on the role of financial reporting in reducing agency conflicts in debt contracting. The likelihood of a firm being able to access the debt market at reasonable costs depends crucially on the firm's financial reporting system. [Armstrong et al. \(2010\)](#) describe the different elements of financial reporting important for lenders in assessing firms' credit quality: the reliability of asset values, the transparency of performance measures, and the usefulness of performance measures for the forecasting of future cash flows and risk. Hence, the authors suggest that financial reporting can be an important component in reducing the agency conflicts that arise in debt-contracting. Empirical evidence like that provided by [Francis et al. \(2005\)](#) supports the notion that higher accounting quality (proxied by accrual quality) is associated with a lower cost of debt.

While empirical evidence on the relation between IFRS adoption (and concurrent enforcement changes) and the cost of equity capital is abundant, there is a smaller (but growing) number of studies related to the debt market. [Florou and Kosi \(2015\)](#) provide evidence that mandatory IFRS adopters pay lower bond yield spreads after adoption. They document that the positive response of debt providers to IFRS holds only for bond issuers who are largely relying on financial statement information; they find no effect for private lenders who have access to nonpublic information. [Florou and Kosi](#) find that mandatory IFRS adopters see bond costs decline by 36.6 basis points subsequent to IFRS adoption relative to a sample of non-adopters.<sup>7</sup> In addition to the cost of bonds decreasing, [Florou and Kosi \(2015\)](#) provide evidence that mandatory IFRS adopters are more likely to issue public debt than to obtain private debt. [Brown \(2016\)](#) provides additional evidence that IFRS adoption eases cross-border financing frictions. Overall, these studies show that public firms gain access to more and cheaper capital after IFRS.

Indirect evidence of the relation between the change in financial reporting and the cost of debt is provided by [Wu and Zhang \(2014\)](#). They examine the relevance of financial statement information for firms' credit ratings around IFRS adoption. The authors find a significant increase in the credit relevance of accounting information after the mandatory IFRS adoption in countries with strong enforcement. Similarly, [Florou et al. \(2017\)](#) provide evidence of an improvement in the credit relevance of financial statements mandatory IFRS adopters. Overall, recent evidence indicates that the change in financial reporting affects the cost of debt.

### 2.1.3. The level of financing

The prior literature supports the notion that IFRS and concurrent enforcement changes increase investment levels. [Zhang \(2013\)](#) presents a theoretical model of the positive relation between accounting quality and the aggregate level of investment. [Loureiro and Taboada \(2015\)](#) find that the ability of insiders to learn from stock market reactions improves post-IFRS, resulting in better-informed investment decisions. [DeFond et al. \(2011\)](#) provide evidence that the increased comparability of financial reporting across IFRS adopting countries attracts foreign investors while [Shroff et al. \(2014\)](#) find that multinational firms invest more in country-industries with more transparent information environments, and [Lawrence \(2013\)](#) finds that individual investors allocate more resources to firms with superior information environments. Results of [Florou and Pope \(2012\)](#) indicate that institutional investors demand more equity investments subsequent to the mandatory adoption of IFRS and pivot their portfolios toward IFRS adopting firms. [Yu and Wahid \(2014\)](#) find that global mutual funds allocate more capital to IFRS adopting firms when they or the mutual fund home country adopt IFRS. [Florou and Kosi \(2015\)](#) report that IFRS adopters are 8.4% more likely to access the bond market subsequent to mandatory IFRS adoption. [Naranjo et al. \(2018\)](#) find that financially constrained firms are 2.6–3.1% more likely to raise external financing after IFRS adoption relative to unconstrained firms, a change of about 9–11% relative to pre-IFRS financing levels. Overall, the prior literature provides support for the notion that IFRS adopters attract new investors and issue more equity and debt around the time of IFRS adoption in the EU.

<sup>6</sup> [Bruggemann et al. \(2013\)](#) provide an overview.

<sup>7</sup> [Chen et al. \(2015\)](#) focus on bank loans and find that firms from IFRS mandating countries experience an increase in loan interest rates. This result contrasts with the finding of [Florou and Kosi \(2015\)](#), who find no effect of IFRS on bank loan costs. The authors of both studies attribute the different results to differences in samples. In contrast to our study, [Chen et al. \(2015\)](#) use multiple countries outside the EU. Our sample only includes the EU because of the availability of private company data. Additionally, our sample of public firms is reported to be more likely to obtain public debt vis-à-vis private debt and, hence, further distinguishes our setting from that examined in [Chen et al. \(2015\)](#). [Ball et al. \(2015\)](#) find a reduction in the use of accounting-based debt covenants after mandatory IFRS adoption. However, the authors point out that they focus on the contracting perspective and do not make inferences on the effect of IFRS on debt pricing.

## 2.2. Financing and product market competition

Bolton and Scharfstein (1990) argue that positive shocks to a firm's financial resources will be used by the firm to aggressively increase market share through price suppression or oversupply. In a similar vein, Benoit (1984) argues that greater financing capabilities vis-à-vis competitors preempt competitor entry or expansion due to the threat of competitive retaliation. Alimov (2016) provides empirical evidence that a positive exogenous shock to firm financial resources causes firms to increase product differentiation and spending on advertising and R&D, ultimately leading to an increase in market share, while Krishnan et al. (2014) find that financially constrained firms increase productivity after increased access to financing. In our setting, public firms experience an increase in financing capacity relative to private firms and can now implement once-marginal net present value projects. Thus, we anticipate that public firms make new investments and gain market share vis-à-vis private firms.

**Hypothesis 1.** IFRS adopters' market share increases around the time of mandatory IFRS adoption and enforcement changes.

There are at least three reasons we might not find the expected results for  $H_1$ . First, Balakrishnan et al. (2014) provide evidence that firms voluntarily increase reporting quality to improve financing capacity. They measure a decrease in financing capacity with changes in firms' collateral values and find that firms respond to the changes with higher reporting quality. This finding could work against our predictions. Private firms placed at a competitive disadvantage vis-à-vis public firms may voluntarily improve their reporting quality to mitigate information asymmetries and access new capital. In many countries, private firms are allowed to voluntarily report under IFRS and may elect to adopt the international standards to improve reporting quality.<sup>8</sup> Moreover, private firms may subject themselves to mandatory IFRS adoption by issuing public equity or bonds. However, in a study of earnings quality among private firm IFRS adopters, Cameran et al. (2014) find that private firms' earnings quality declines following IFRS, consistent with private firm managers' exploiting the flexibility inherent in IFRS in the absence of external monitors. In our own analysis, we observe very few private firms reported in the Bureau van Dijk database switching their accounting standard to IFRS around 2005. Nonetheless, any countervailing actions by private firms may offset incremental effects of IFRS on public firm financing and work against our hypotheses.

Second, IFRS firms may reveal useful proprietary information to private firms if only public firms improve financial reporting (see, e.g., Jong et al., 2012; Leuz and Wysocki, 2016). For example, IFRS treatment of fair value accounting vis-à-vis local GAAP can reveal details about asset values of public firms.<sup>9</sup> When private firms gain access to private information of public firms, they may gain strategic advantages that help to strengthen their competitive position. If the proprietary cost effect outweighs public firm financing effect on competition, no effect or an outcome opposite to that which we predict may be observed.

The third limitation is our strong assumption that the EU setting is characterized by vigorous competition and competition that is sensitive enough to detect an information effect. We note that this assumption may not hold because bank-based continental Europe is characterized by lower levels of competition and less frequent use of performance-based compensation vis-à-vis the U.K. and the U.S. (Januszewski et al., 2002). In summary, there are at least three countervailing factors working against our hypotheses, and, as such, the relation we study is an empirical issue.

## 3. Sample selection and research design

### 3.1. Sample selection

We choose the EU IFRS adoption setting to examine an exogenous change in financial reporting. Table 1 presents the sample selection procedures and distribution for the dataset drawn from Bureau Van Dijk's Orbis database. Panel A presents the sample selection procedure in total and by country. We exclude firm-year observations missing any of our control variables. Panel B presents the annual distribution, Panel C presents the distribution by country, and Panel D presents the distribution by industry (Fama-French 10 classification, for brevity). The final sample consists of 3,707,896 observations in the EU for the period 2000–2010.<sup>10</sup>

The sample includes public and private EU firms because our main tests examine both public and private market share within year and industry (4-digit SIC). We acknowledge that a disadvantage of this research design choice is that we do not compare public EU firms with a control group of public firms in countries adopting neither IFRS nor contemporaneous financial reporting enforcement mechanisms. However, this research design would be limited to public firms only due to the absence of private firm data outside of the EU. Consequently, such a test would not allow us to observe the intertemporal shifts in relative market share from private to public firms that underlie our main tests.

### 3.2. Research design

We test  $H_1$  estimating Eq. (1) with multiple specifications that vary industry, country and year fixed effects and the clustering of standard errors. IFRS firms are identified as public firms that mandatorily adopt IFRS in 2005. To identify public firms, we rely on the

<sup>8</sup> Pownall and Wiczynska (2018, Table 1) provide an overview of the countries that allow IFRS adoption for private firms.

<sup>9</sup> Landsman (2007) provides an overview of the fair value literature.

<sup>10</sup> We note that our sample period includes the financial crisis period from 2008 to 2009. In untabulated results, our findings remain qualitatively and quantitatively similar when we omit 2008 and 2009 data from the sample.



Table 1 (continued)

2010	427,085	12%	2010	2314	11%
Total	3,687,497	100%	Total	20,399	100%
<b>Panel C: Country Distribution Across Private and Public Firm Observations</b>					
<b>Private Firms</b>					
Country	N	%	Country	N	%
Austria	4631	0%	Austria	441	2%
Finland	81,583	2%	Finland	948	5%
France	1,109,159	30%	France	4377	21%
Germany	57,273	2%	Germany	3447	17%
Greece	105,300	3%	Greece	1130	6%
Italy	1,123,874	30%	Italy	1252	6%
Netherlands	28,589	1%	Netherlands	928	5%
Spain	800,343	22%	Spain	682	3%
Sweden	127,081	3%	Sweden	1620	8%
United Kingdom	249,664	7%	United Kingdom	5,574	27%
Total	3,687,497	100%	Total	20,399	100%
<b>Panel D: Industry (Fama French 10 Classification) Distribution Across Private and Public Firm Observations</b>					
<b>Private Firms</b>					
Year	N	%	Year	N	%
Consumer Nondurables	315,969	9%	Consumer Nondurables	2588	13%
Consumer Durables	84,741	2%	Consumer Durables	841	4%
Manufacturing	599,935	16%	Manufacturing	4332	21%
Oil, Gas and Coal Extraction	6983	0%	Oil, Gas and Coal Extraction	398	2%
Business Equipment	135,087	4%	Business Equipment	3967	19%
Telecommunications	13,781	0%	Telecommunications	814	4%
Wholesale and Retail	1,249,004	34%	Wholesale and Retail	2063	10%
Healthcare	65,177	2%	Healthcare	914	4%
Utilities	1989	0%	Utilities	0	0%
Mines, Construction, Transportation	1,214,831	33%	Mines, Construction, Transportation	4482	22%
Total	3,687,497	100%	Total	20,399	100%

availability of market price data from the Orbis database. We assume the firm is public (private) when market price data are available (unavailable). Because several EU countries permitted early IFRS adoption or IFRS deferral for companies that are either trading only debt securities or using internationally accepted accounting standards like US-GAAP (Pownall and Wieczynska, 2018), we examine two distinct samples. The first (i.e., the full sample) includes all EU countries and firms for which data are available while the second includes only those countries that did not permit early or deferred IFRS adoption and excludes those public firms identified as voluntary adopters by Daske et al. (2013).<sup>11,12</sup>

$$\begin{aligned} \text{Market Share} = & \beta_0 + \beta_1 \text{Public Firm Indicator} + \beta_2 \text{Post-Mandatory IFRS Year Indicator} + \beta_3 \text{Public Firm Indicator} \times \text{Post} \\ & \text{-Mandatory IFRS Year Indicator} + \beta_4 \text{PPE} + \beta_5 \text{Sales Growth} + \beta_6 \text{Leverage} + \beta_7 \text{Debt Issue} + \beta_8 \text{Turnover} \\ & + \beta_9 \text{Size} + \beta_{10} \text{Loss Indicator} + \beta_{11} \text{Std(Sales)} + \beta_{12} \text{ROA} + \beta_{13} \text{Intangible Assets} + \beta_{14} \text{Industry-Country} \\ & \text{-YearM \& A Activity} + \beta_{15} \text{Industry-Country-Year IPO} + \text{Fixed Effects} + \varepsilon + \beta_{15} \text{Industry-Country-YearIPO} \\ & + \text{Fixed Effects} + \varepsilon \end{aligned} \quad (1)$$

*Market Share* is the individual firm sales scaled by sales at the industry-year level based on the four-digit SIC code.<sup>13,14</sup> This measure assumes that EU firms compete with all other EU firms. This assumption is consistent with evidence provided in Aussilloux et al. (2017), arguing that European Integration has led to an increase in intra-EU competition. *Public Firm Indicator* is an indicator equal to one when the firm has market price data available and equal to zero otherwise.<sup>15</sup> The *Post-Mandatory IFRS Year Indicator* is equal to one when the reporting year ends after June 30th, 2005, and equal to zero otherwise. The coefficient on the interaction between *Public Firm Indicator* and *Post-Mandatory IFRS Year Indicator* in Eq. (1) represents the change in IFRS firms' market share for IFRS adopting firms after 2005. Consistent with H<sub>1</sub>, we expect  $\beta_3$  in Eq. (1) to be positive and significant. We assume in our models that all public firms adopt IFRS in the post-2005 period and acknowledge that this assumption is more plausible in our restricted sample. Nevertheless, misidentification, or the extent to which public firms do not comply with the mandate of IFRS reporting after 2005, will bias against our predictions. As an alternative measure, we use the accounting standard variable contained within the Bureau Van Dijk's Orbis database to identify IFRS adopters. When the accounting standard variable is used to identify IFRS adopters, results remain qualitatively and quantitatively similar to those presented. We choose not to rely primarily on the Bureau Van Dijk's Orbis database accounting standard variable ("acctstd") because, after manually reconciling the firm accounting standards reported in the database to publicly available annual company reports for a large random sample, we find that a non-trivial proportion of the reports were inaccurately coded by the Bureau Van Dijk's Orbis database.<sup>16</sup>

Control variables are motivated generally by Ahmed et al. (2013) but also by the prior literature where noted. *PPE* is property, plant and equipment scaled by total assets. Fixed assets are included because entry barriers affect competition (Wernerfelt, 1984). *Sales Growth* is sales in period  $t$  minus sales in period  $t - 1$  scaled by sales in period  $t - 1$ . This variable is included because sales are associated with a larger number of firms and because larger markets attract more entrants (Sutton, 1991). *Leverage* is set equal to total debt scaled by book value of equity. Debt is included because leverage has a negative relation with competition (Bolton and Scharfstein, 1990; Chevalier, 1995; Tirole, 1986). *Debt Issue* is set equal to current plus long-term liabilities scaled by average assets. *Turnover* is sales scaled by total assets. *Size* is equal to the natural logarithm of total assets. *Loss Indicator* is equal to one when the firm reports negative income and is included because competition may be a nonlinear function of industry profitability. *Std(Sales)* is the standard deviation of sales for the years  $t - 4$  through  $t$ . The standard deviation of sales is included because greater variance in sales may permit more opportunities for competitive behavior. *ROA* is net income scaled by total assets. *ROA* is included because high profits can attract entrants (Harris, 1998; Scott, 1994), though it may also signify collusive behavior by oligopolists (Stigler, 1964). *Intangible Assets* are total intangibles scaled by total sales. Intangibles are included because intangible assets present entry barriers not captured under fixed assets. Merger (initial public offering [IPO]) activity is the quotient of the frequency of mergers (IPOs) within an industry-country-year group divided by the number of firms within the industry-country-year group. These measures are included to control for increases in listing and M&A activity noted around IFRS adoption (Hong et al., 2014). We capture cross-country variance

<sup>11</sup> The countries in our sample that allowed either early adoption or deferral of IFRS are Austria, France, Finland, Germany and Greece.

<sup>12</sup> Even with this modified sample, we still expect imperfect identification due to evidence reported in Pownall and Wieczynska (2018) that 35% of EU-regulated firms were using non-IFRS GAAP in 2005 and that this rate fell to only 16% by 2009. Furthermore, many of our sample countries (e.g., Hungary, Italy, Spain and Sweden) permit private firms to adopt IFRS, suggesting that at least some of the firms we label as non-IFRS adopters are mislabelled. To our knowledge, these IFRS adoption identification errors are an unavoidable limitation of our research design. If private firms adopt IFRS but are not classified as adopting IFRS, then this would make our IFRS measure noisy and bias against the finding of results consistent with our hypotheses.

<sup>13</sup> We acknowledge that using SIC to identify industry structure has shortcomings; however, no alternative is available from the Bureau van Dijk database (e.g., Hoberg-Phillips TNIC industry classification).

<sup>14</sup> The data do not allow the disaggregation of sales into domestic and foreign sales. This is a limitation of the data because an increase in foreign sales used to gain market share could be interpreted differently from an increase in market share as a result of domestic sales.

<sup>15</sup> We note that privately held firms with publicly held debt may use IFRS. Misidentifying IFRS adopters as private firms works against our hypotheses.

<sup>16</sup> We randomly select 500 firms from the largest 5000 firms in the Orbis database. We find 72 annual reports and compare the accounting standard noted therein to the accounting standard reported in Orbis for the respective firm-year. Of the 72 Orbis firm-years examined, 38 had accurate accounting standard data. An Orbis representative stated that "[t]he issue is that [Orbis] does not include annual report data; instead, all the data [are] sourced from the local registry filings" (e-mail correspondence, July 22, 2014).

in investor protection using factor analysis. We create a factor variable capturing time-varying rule of law, judiciary efficiency and regulatory quality scores using data from La Porta et al. (2002) and Kaufmann et al. (2009, p. 6).<sup>17</sup> Our factor analysis (untabulated) suggests that one factor explains about 83% of the cumulative variance. Further, this first factor has an eigenvalue of 2.463 while the second factor's eigenvalue is 0.468.<sup>18</sup> Our final variable controls for low and high differences between pre-IFRS local GAAP and IFRS using the measure tabulated by Bae et al. (2008).

## 4. Results

### 4.1. Descriptive statistics and correlations

Table 2 presents the descriptive statistics for the sample at the firm-year level.<sup>19</sup> We report summary statistics for private (3,687,497 firm-year observations) and public (20,399 firm-year observations) firms. Public firm variables are generally consistent with the prior literature. The low percentage of public firms supports the inclusion of private firms when measuring industry market share and product market competition. Public firms average 2.4% of market share for each industry-year compared to a market share of less than 0.001% for private firms. While the firm-level results reveal a greater level of average market share for public firms versus private firms, untabulated results show that, in the aggregate, public firms have 18% of market share, and private firms have 82%. Private firms' large share of the market further supports arguments for the inclusion of private firms when measuring industry market share and competition (see, e.g., (Ali et al., 2009)).

Table 3 presents the correlation matrix for the variables used in the regression analysis. It is difficult to make inferences in support of our hypotheses at the univariate level given that we are interested in the interaction between public firms and IFRS adoption. The negative association between mandatory IFRS and firms' market share indicates that individual firms' market share has declined throughout our sample period. This is consistent with the large number of private firms losing market share to a much smaller number of public firms after IFRS. Control variables have reasonable associations with the dependent variable. For example, public firms have much larger market shares, and firm market share increases with PP&E (i.e., market entry costs), sales growth, leverage, size, intangibles and M&A and IPO activity.

### 4.2. Financial reporting regulation, market share and product market competition

Table 4 presents the estimated coefficients from Eq. (1) using the full sample. Eq. (1) is used to test our prediction of an increase in public firms' market share following the mandatory adoption of IFRS and concurrent regulation. The dependent variable is the level of firm market share measured at the industry-four digit SIC level. Column (1) presents a univariate test and reports a significantly positive coefficient on our test interaction, *Public Firm Indicator*  $\times$  *Post-Mandatory IFRS Year Indicator*, providing our first evidence that public firms increase market share after IFRS adoption. The coefficient on *Post-Mandatory IFRS Year Indicator* captures the change in market share for non-adopters after IFRS. Because market share is a relative construct, non-adopters must lose market share for adopters to gain market share. We find that this is indeed the case as this variable is negative and statistically significant.

In columns (2) through (6), we add controls. In columns (3) to (6), we add industry and country, industry and year, industry and country and year, or industry  $\times$  country  $\times$  year fixed effects. Across these columns, our test interaction coefficient remains positive but becomes statistically significant only in the most rigorous specification reported in column (6). To improve identification of IFRS adopters, we next exclude firms in countries that allowed firms to adopt IFRS early or defer the adoption to a later period (Pownall and Wiczynska, 2018) as well as any firms in our sample that are identified in Daske et al. (2013) as public voluntary adopters.<sup>20</sup> Column (1) of Table 5 presents a univariate test of Eq. (1) and reports a positive and statistically significant coefficient on our test variable, *Public Firm Indicator*  $\times$  *Post-Mandatory IFRS Year Indicator*, across all columns. This result is robust to including our suite of control variables and fixed effect variants.<sup>21</sup> Increased statistical significance and larger magnitudes of our test coefficient as we improve our identification of IFRS adopters supports  $H_1$ .

### 4.3. Additional analysis to support $H_1$

Our analyses presented in Tables 4 and 5 examine the full and restricted EU sample, respectively. To alleviate the concern that our results are driven by an omitted variable that is correlated with both public firm status and market share, we use a matched sample in Table 6. Our treatment firms continue to be public firms that adopted IFRS in 2005. The control group is matched private firms, and the sample is limited to the restricted countries (i.e., countries that did not allow early adoption or deferral of IFRS adoption). We

<sup>17</sup> The regulatory quality measure is used in a similar setting by Christensen et al. (2013) and Godsell et al. (2017) to capture country-level characteristics.

<sup>18</sup> We follow Kaiser (1960), who notes that it is customary to retain all factors with an eigenvalue greater than one.

<sup>19</sup> *Industry-Country-Year M&A Activity* and *Industry-Country-Year IPO Activity* are omitted from the summary statistics table because they do not vary based on firm, but only by industry-country-year.

<sup>20</sup> Daske et al. (2013) apply a broad classification of IAS/IFRS adopters, i.e. firms reporting under local GAAP that have a reconciliation to IAS/IFRS or with dual reporting are classified as voluntary adopter. Hence, firms in countries that did not allow early adoption can also be classified as voluntary adopters under their approach.

<sup>21</sup> We use 2-digit SIC for all industry fixed effects.

**Table 2**  
Sample Summary Statistics, Full Sample. This table provides summary statistics for the variables used in our analyses. All variables are defined in Appendix A.

Private Firms	Market Share	Post-IFRS Indicator	PP&E	Sales Growth	Leverage	Debt Issue	Turnover
N	3,687,497	3,687,497	3,687,497	3,687,497	3,687,497	3,687,497	3,687,497
Mean	0.00	0.61	0.17	0.05	0.23	0.48	0.94
St. Dev.	0.01	0.49	0.16	0.26	0.46	0.17	0.37
25th Percentile	0.00	0.00	0.04	-0.09	0.00	0.37	0.70
50th Percentile	0.00	1.00	0.12	0.06	0.00	0.50	0.92
75th Percentile	0.00	1.00	0.26	0.20	0.24	0.60	1.15
N	20,399	20,399	20,399	20,399	20,399	20,399	20,399
Mean	0.02	0.59	0.21	0.08	0.31	0.40	0.72
St. Dev.	0.10	0.49	0.16	0.26	0.37	0.14	0.30
25th Percentile	0.00	0.00	0.07	-0.05	0.02	0.31	0.53
50th Percentile	0.00	1.00	0.17	0.09	0.20	0.41	0.71
75th Percentile	0.00	1.00	0.31	0.21	0.46	0.50	0.90

  

Private Firms	Size	Loss Indicator	Std(Sales)	ROA	Intangible Assets	Industry-Country-Year Measure of M&A Activity	Industry-Country-Year Measure of IPO Activity	Country Level Investor Protection
N	3,687,497	3,687,497	3,687,497	3,687,497	3,687,497	3,687,497	3,687,497	3,687,497
Mean	1.40	0.18	0.30	0.03	0.03	0.00	0.00	0.02
St. Dev.	1.29	0.38	0.31	0.08	0.07	0.00	0.01	0.96
25th Percentile	0.45	0.00	0.11	0.00	0.00	0.00	0.00	-0.67
50th Percentile	1.11	0.00	0.20	0.02	0.00	0.00	0.00	-0.58
75th Percentile	2.06	0.00	0.36	0.07	0.02	0.00	0.00	0.52
N	20,399	20,399	20,399	20,399	20,399	20,399	20,399	20,399
Mean	4.92	0.23	0.18	0.02	0.15	0.00	0.01	1.04
St. Dev.	1.22	0.42	0.21	0.10	0.16	0.01	0.04	1.10
25th Percentile	4.13	0.00	0.07	0.00	0.02	0.00	0.00	0.50
50th Percentile	5.39	0.00	0.12	0.04	0.08	0.00	0.00	1.42
75th Percentile	5.97	0.00	0.22	0.07	0.23	0.00	0.00	1.74



**Table 4**

Impact of IFRS on IFRS Adopter Market Share, Full Sample. This table presents the estimated coefficients from Eq. (1) to test our hypotheses at the firm-level. The dependent variable is the firm-year market share calculated as firm sales divided by total sales within the SIC4-Year group. p-values are two-tailed significance. \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.010. See Appendix A for variable definitions.

	(1) Full Sample Dependent Variable = Market Share	(2)	(3)	(4)	(5)	(6)
Public Firm Indicator	0.0209*** (176.26)	0.0169*** (3.84)	0.0166*** (3.89)	0.0166*** (3.90)	0.0166*** (3.89)	0.0169*** (13.64)
Post-Mandatory IFRS Year Indicator	-0.000159*** (-13.67)	-0.000290*** (-5.26)	-0.000312*** (-5.63)			
Public Firm Indicator × Post-Mandatory IFRS Year Indicator	0.00355*** (22.92)	0.00249 (1.05)	0.00228 (1.00)	0.00222 (0.98)	0.00226 (0.99)	0.00357* (1.94)
PP&E		0.00108*** (3.86)	-0.00000617 (-0.04)	-0.0000143 (-0.10)	-0.00000861 (-0.06)	-0.000131*** (-2.61)
Sales Growth		-0.0000146 (-0.20)	-0.000140** (-2.61)	-0.0000463 (-1.09)	-0.0000588 (-1.31)	-0.0000134 (-0.54)
Leverage		0.0000423 (1.05)	0.0000680** (2.32)	0.0000611** (2.23)	0.0000667** (2.34)	0.0000413*** (2.92)
Debt Issue		-0.000575*** (-4.03)	-0.000130 (-1.65)	-0.000135 (-1.66)	-0.000167** (-2.07)	-0.000184*** (-4.45)
Turnover		0.000524** (2.13)	0.000759*** (3.66)	0.000729*** (3.51)	0.000733*** (3.57)	0.000733*** (19.30)
Size		0.000551*** (5.70)	0.000524*** (5.69)	0.000543*** (5.76)	0.000525*** (5.70)	0.000513*** (32.12)
Loss Indicator		0.0000333 (0.89)	-0.0000494* (-1.99)	-0.0000277 (-1.16)	-0.0000381 (-1.55)	-0.0000346** (-2.03)
Std(Sales)		-0.000116 (-1.63)	-0.000103** (-2.54)	-0.000104** (-2.37)	-0.0000818** (-2.10)	-0.0000446** (-2.57)
ROA		-0.000292 (-1.12)	0.0000968 (0.54)	-0.000145 (-0.80)	0.0000409 (0.23)	-0.000159 (-1.50)
Intangible Assets		0.000997* (1.83)	0.000755* (1.88)	0.000640 (1.62)	0.000728* (1.82)	0.000948*** (5.88)
Industry-Country-Year Measure of M&A Activity		0.476*** (13.25)	0.457*** (16.71)	0.457*** (16.72)	0.457*** (16.71)	
Industry-Country-Year Measure of IPO Activity		0.187*** (3.04)	0.182*** (2.67)	0.181*** (2.67)	0.182*** (2.67)	
Country Investor Protection Factor		0.00000229 (0.07)	-0.000125 (-1.23)	0.00000335 (0.11)	0.000166 (1.46)	
GAAP Difference Measure		-0.00000106 (-0.07)		0.0000178 (1.49)		
Constant	0.00102*** (112.41)	-0.000182 (-0.59)				
Adjusted R-Squared	0.0241	0.129	0.175	0.175	0.175	0.173
Number of Observations	3,707,896	3,707,896	3,707,896	3,707,896	3,707,896	3,707,896
Standard Errors Clustered By:	No Clustering	Industry	Industry	Industry	Industry	Industry × Country × Year
Industry Fixed Effects:	No	No	Yes	Yes	Yes	No
Country Fixed Effects:	No	No	Yes	No	Yes	No
Year Fixed Effects:	No	No	No	Yes	Yes	No
Industry × Country × Year Fixed Effects	No	No	No	No	No	Yes

match public firms with private firms based on country, industry, year and a 5% size caliper. While the coefficients on the interaction between *Public Firm Indicator* × *Post-Mandatory IFRS Year Indicator* are weaker in columns (1) through (6) than the analogous coefficients reported in Table 5, the coefficients remain positive with statistical significance in two of the six specifications. Importantly, we observe statistical significance in our most rigorous specification reported in column (6). Overall, results generated with our matched sample provide additional support for our hypothesis.

#### 4.4. Product market analysis: competition

We seek to corroborate our main hypothesis by testing the effect of IFRS adoption and enforcement changes on product market competition. If already large public firms increase market share, then industry sales concentration (competition) should increase (decrease). We capture competition using the Herfindahl Index (HHI). We chose the HHI as our measure of product market competition because it is the measure of competition used by antitrust regulators worldwide, including the EU Commission, the Antitrust Division of the U.S. Department of Justice and the U.S. Federal Trade Commission. The measure is negatively related with

**Table 5**

Impact of IFRS on IFRS Adopter Market Share, Restricted Sample. This table presents the estimated coefficients from Eq. (1) to test our hypotheses at the firm-level after excluding voluntary adopters and firms in countries that permitted early or deferred adoption. The dependent variable is the firm-year market share calculated as firm sales divided by total sales within the SIC4-Year group. p-values are two-tailed significance. \*p < 0.10, \*\*p < 0.05, \*\*\*p < 0.010. See Appendix A for variable definitions.

	(1)	(2)	(3)	(4)	(5)	(6)
	<b>Restricted Sample</b>					
	Dependent Variable = Market Share					
Public Firm Indicator	0.0141*** (54.11)	0.00986*** (2.65)	0.00966** (2.62)	0.00956** (2.60)	0.00966** (2.62)	0.0114*** (6.92)
Post-Mandatory IFRS Year Indicator	-0.000149*** (-14.23)	-0.000213*** (-4.29)	-0.000223*** (-4.60)			
Public Firm Indicator × Post-Mandatory IFRS Year Indicator	0.0135*** (42.08)	0.0112** (2.06)	0.0108* (1.98)	0.0108* (1.98)	0.0108* (1.98)	0.0131*** (3.42)
PP&E		0.000755*** (3.08)	-0.0000450 (-0.42)	-0.000121 (-1.14)	-0.0000404 (-0.38)	-0.000150*** (-3.54)
Sales Growth		0.0000304 (0.46)	-0.000124*** (-2.78)	-0.00000621 (-0.18)	-0.0000293 (-0.80)	0.0000106 (0.52)
Leverage		-0.0000807*** (-2.90)	0.0000132 (0.92)	-0.0000432*** (-2.81)	0.00000775 (0.55)	-0.0000127 (-1.45)
Debt Issue		-0.000478*** (-4.13)	-0.000177** (-2.48)	-0.0000845 (-1.27)	-0.000209*** (-2.87)	-0.000191*** (-4.71)
Turnover		0.000508* (1.92)	0.000710*** (3.91)	0.000657*** (3.67)	0.000682*** (3.81)	0.000683*** (17.38)
Size		0.000481*** (5.73)	0.000464*** (5.82)	0.000477*** (5.83)	0.000465*** (5.84)	0.000456*** (27.75)
Loss Indicator		0.0000687** (2.28)	-0.0000360 (-1.61)	0.000000995 (0.05)	-0.0000264 (-1.20)	-0.0000173 (-1.18)
Std(Sales)		-0.0000945 (-1.28)	-0.0000468 (-1.24)	-0.0000726* (-1.78)	-0.0000262 (-0.70)	-0.00000374 (-0.23)
ROA		-0.000497* (-1.70)	-0.000146 (-0.79)	-0.000425** (-2.07)	-0.000217 (-1.14)	-0.000291** (-2.42)
Intangible Assets		0.000944* (1.84)	0.000216 (1.04)	0.000174 (0.83)	0.000174 (0.84)	0.000201 (1.42)
Industry-Country-Year Measure of M&A Activity		0.451*** (5.12)	0.412*** (6.54)	0.412*** (6.54)	0.412*** (6.55)	
Industry-Country-Year Measure of IPO Activity		0.218*** (3.60)	0.226*** (3.50)	0.225*** (3.47)	0.226*** (3.49)	
Country Investor Protection Factor		0.0000340 (0.75)	0.000365** (2.49)	0.0000304 (0.77)	0.000613** (2.51)	
GAAP Difference Measure		0.0000126 (0.77)		0.0000292** (2.32)		
Constant	0.00106*** (128.22)	-0.000222 (-0.64)				
Adjusted R-Squared	0.0105	0.121	0.215	0.215	0.216	0.247
Number of Observations	2,327,942	2,327,942	2,327,942	2,327,942	2,327,942	2,327,942
Standard Errors Clustered By:	No Clustering	Industry	Industry	Industry	Industry	Industry × Country × Year
Industry Fixed Effects:	No	No	Yes	Yes	Yes	No
Country Fixed Effects:	No	No	Yes	No	Yes	No
Year Fixed Effects:	No	No	No	Yes	Yes	No
Industry × Country × Year Fixed Effects	No	No	No	No	No	Yes

competition. Aslan and Kumar (2016) find that firms respond to performance improvements of competitors by improving productivity, differentiating products and lowering prices. Consistent with these results and the theoretical arguments advanced by Bolton and Scharfstein (1990), we predict that firms will use exogenous increases in liquidity to gain a competitive advantage on rivals, leading to a decrease in competition. We use Eq. (2) to test this prediction.

**Table 6**

Impact of IFRS on IFRS Adopter Market Share, Matched Sample. This table presents the estimated coefficients from Eq. (1) to test our hypotheses at the firm-level using a matched sample. The matched sample is restricted to the restricted sample. Each public firm is matched to a private firm based on country, industry, year and a  $\pm$  5% size caliper. The dependent variable is the firm-year market share calculated as firm sales divided by total sales within the SIC4-Year group. p-values are two-tailed significance. \*p < 0.10, \*\*p < 0.05, \*\*\*p < 0.010. See Appendix A for variable definitions.

	(1)	(2)	(3)	(4)	(5)	(6)
	<b>Restricted Sample</b>					
	Dependent Variable = Market Share					
Public Firm Indicator	-0.0157*** (-13.41)	-0.00873*** (-3.53)	-0.00751*** (-3.20)	-0.00721*** (-3.18)	-0.00743*** (-3.17)	-0.00547*** (-5.46)
Post-Mandatory IFRS Year Indicator	0.000959 (0.84)	-0.00521*** (-4.13)	-0.00645*** (-6.03)			
Public Firm Indicator $\times$ Post-Mandatory IFRS Year Indicator	-0.000153 (-0.10)	0.00297* (1.70)	0.00201 (1.34)	0.00190 (1.24)	0.00231 (1.55)	0.00284** (2.02)
PP&E		0.0169** (2.16)	0.00398 (0.66)	0.00386 (0.64)	0.00356 (0.59)	0.00404** (2.31)
Sales Growth		-0.00399* (-1.92)	-0.00238 (-1.65)	-0.00105 (-0.74)	-0.00106 (-0.77)	0.0000471 (0.03)
Leverage		0.00311* (1.68)	0.00161 (1.07)	0.00166 (1.10)	0.00164 (1.09)	0.00108 (1.61)
Debt Issue		-0.00574 (-1.23)	-0.00556 (-1.32)	-0.00575 (-1.40)	-0.00595 (-1.42)	-0.00710*** (-4.42)
Turnover		0.0150*** (4.38)	0.0122*** (4.71)	0.0126*** (4.76)	0.0122*** (4.76)	0.00941*** (11.93)
Size		0.0172*** (9.39)	0.0164*** (7.24)	0.0167*** (7.33)	0.0165*** (7.25)	0.0162*** (26.01)
Loss Indicator		0.00215 (1.19)	0.00180 (1.07)	0.00174 (1.04)	0.00193 (1.14)	0.00134 (1.27)
Std(Sales)		0.00464 (0.90)	0.00524 (1.30)	0.00485 (1.13)	0.00487 (1.22)	0.00737*** (3.78)
ROA		0.00205 (0.16)	0.00767 (0.70)	0.00390 (0.35)	0.00612 (0.56)	0.00496 (0.85)
Intangible Assets		0.00321 (0.51)	0.00622 (1.26)	0.00649 (1.31)	0.00661 (1.35)	0.00677*** (3.78)
Industry-Country-Year Measure of M&A Activity		0.0411 (1.18)	-0.00992 (-1.31)	-0.0114 (-1.49)	-0.00948 (-1.27)	
Industry-Country-Year Measure of IPO Activity		0.0362** (2.65)	0.0205** (2.49)	0.0192** (2.21)	0.0197** (2.36)	
Country Investor Protection Factor		0.00957*** (4.96)	-0.00831*** (-3.89)	0.0104*** (5.19)	-0.00562** (-2.11)	
GAAP Difference Measure		0.00261*** (5.74)		0.00262*** (5.41)		
Constant	0.0345*** (41.72)	-0.111*** (-7.46)				
Adjusted R-Squared	0.0236	0.440	0.562	0.559	0.564	0.690
Number of Observations	16,151	16,151	16,151	16,151	16,151	16,151
Standard Errors Clustered By:	No Clustering	Industry	Industry	Industry	Industry	Industry $\times$ Country $\times$ Year
Industry Fixed Effects:	No	No	Yes	Yes	Yes	No
Country Fixed Effects:	No	No	Yes	No	Yes	No
Year Fixed Effects:	No	No	No	Yes	Yes	No
Industry $\times$ Country $\times$ Year Fixed Effects	No	No	No	No	No	Yes

$$\begin{aligned}
 \text{Industry HHI} = & \alpha_0 + \alpha_1 \text{ Industry Public Firm Indicator} + \alpha_2 \text{ Post-Mandatory IFRS Year Indicator} \\
 & + \alpha_3 \text{ Industry Public Firm Indicator} \times \text{Post-Mandatory IFRS Year Indicator} + \alpha_4 \text{ Industry PPE} \\
 & + \alpha_5 \text{ Industry Sales Growth} + \alpha_6 \text{ Industry Leverage} + \alpha_7 \text{ Industry Debt Issue} + \alpha_8 \text{ Industry Turnover} \\
 & + \alpha_9 \text{ Industry Size} + \alpha_{10} \text{ Industry Loss Indicator} + \alpha_{11} \text{ Industry Std Sales} + \alpha_{12} \text{ Industry ROA} \\
 & + \alpha_{13} \text{ Intangible Assets} + \alpha_{14} \text{ Industry-Country-Year M \& A Activity} + \alpha_{15} \text{ Industry-Country-Year IPO} \\
 & + \text{Fixed Effects} + \varepsilon
 \end{aligned} \tag{2}$$

All variables except for the HHI are defined above. Variables preceded by *Industry* indicate that the variable is the industry-year average with industries defined at the four-digit SIC level. We use industry-year instead of firm-level data, so the independent

**Table 7**

Impact of IFRS on IFRS Adopter HHI, Full Sample. This table examines the effect of IFRS on industry sales concentration. The dependent variable is the HHI calculated as the sum of firm sales squared by SIC4-Year group. *p*-values are two-tailed significance. \* *p* < 0.10, \*\* *p* < 0.05, \*\*\* *p* < 0.010. See [Appendix A](#) for variable definitions.

	(1)	(2)	(3)	(4)	(5)
	<b>Full Sample</b>				
	Dependent Variable = HHI				
Public Firm Indicator	0.417*** (22.09)	0.0914 (1.51)	0.0598 (1.17)	0.0563 (1.10)	0.0559 (1.09)
Post-Mandatory IFRS Year Indicator	-0.00820 (-1.07)	-0.0208* (-1.94)	-0.0364*** (-3.55)		
Public Firm Indicator × Post-Mandatory IFRS Year Indicator	0.0654*** (2.76)	0.0675 (1.19)	0.0815 (1.65)	0.0916* (1.76)	0.0852* (1.71)
PP&E		-0.171 (-1.21)	-0.402** (-2.38)	-0.420** (-2.49)	-0.409** (-2.41)
Sales Growth		0.0664 (1.39)	0.0416 (0.88)	0.0895 (1.22)	0.0896 (1.26)
Leverage		0.0625 (0.92)	0.0459 (0.73)	0.0436 (0.68)	0.0467 (0.74)
Debt Issue		-0.315 (-1.46)	-0.187 (-0.92)	-0.192 (-0.90)	-0.198 (-0.95)
Turnover		0.164* (1.84)	0.120 (1.11)	0.117 (1.08)	0.109 (1.01)
Size		0.0777*** (4.74)	0.107*** (6.08)	0.106*** (5.51)	0.107*** (6.06)
Loss Indicator		0.0206 (0.21)	0.0456 (0.60)	0.0569 (0.72)	0.0558 (0.73)
Std(Sales)		-0.119 (-0.90)	-0.148 (-1.04)	-0.154 (-1.08)	-0.140 (-0.98)
ROA		-0.702** (-2.12)	-0.530* (-1.74)	-0.526* (-1.68)	-0.553* (-1.78)
Intangible Assets		0.357 (1.43)	0.307 (1.40)	0.322 (1.46)	0.298 (1.37)
Industry-Country-Year Measure of M&A Activity		0.267*** (5.65)	0.215*** (6.45)	0.214*** (6.34)	0.216*** (6.49)
Industry-Country-Year Measure of IPO Activity		0.0652 (1.58)	0.0597 (1.41)	0.0580 (1.38)	0.0594 (1.37)
Country Investor Protection Factor		-0.00352 (-0.13)	-0.0190 (-0.65)	-0.0385 (-1.26)	-0.0183 (-0.62)
GAAP Difference Measure		-0.00808 (-1.03)		-0.00646 (-0.80)	
Constant	0.0706*** (12.20)	0.0760 (0.43)			
Adjusted R-Squared	0.292	0.494	0.606	0.605	0.608
Number of Observations	3902	3902	3902	3902	3902
Standard Errors Clustered By:	No Clustering	Industry	Industry	Industry	Industry
Industry Fixed Effects:	No	No	Yes	Yes	Yes
Country Fixed Effects:	No	No	Yes	No	Yes
Year Fixed Effects:	No	No	No	Yes	Yes
Industry × Country × Year Fixed Effects	No	No	No	No	No

variables are consistent with the measurement of the dependent variable. *HHI* is the industry HHI measured as the sum of all squared market shares of all firms in an industry-year. The *Public Firm Indicator* at the industry-year level (*Industry Public Firm Indicator*) represents the percentage of public firms within the respective industry-year.

We report tests of Eq. (2) for the full sample in [Table 7](#). Column (1) presents a univariate test and reports a positive and statistically significant coefficient on our test interaction, *Industry Public Firm Indicator* × *Post-Mandatory IFRS Year*. In columns (2) through (5), we add control variables aggregated at the country-year-industry level and fixed effects. We do not include a specification with country × year × industry fixed effects because these fixed effects would subsume the variation in our dependent variable. For two of the four specifications, the coefficient on the interaction remains positive and we observe statistical significance in the more rigorous specifications reported in columns (4) and (5). These results are consistent with an increase in the HHI following IFRS adoption for industries with a relatively high percentage of public firms. This result supports the notion that the broad category

**Table 8**

Impact of IFRS on HHI, Restricted Sample. This table examines the effect of IFRS on industry sales concentration after excluding voluntary adopters and firms in countries that permitted early or deferred adoption. The dependent variable is the HHI calculated as the sum of firm sales squared by SIC4-Year group. p-values are two-tailed significance. \*p < 0.10, \*\*p < 0.05, \*\*\*p < 0.010. See Appendix A for variable definitions.

	(1)	(2)	(3)	(4)	(5)
	<b>Restricted Sample</b>				
	Dependent Variable = HHI				
Public Firm Indicator	0.0820 (1.38)	−0.0308 (−0.56)	−0.0628 (−1.24)	−0.0438 (−0.93)	−0.0612 (−1.15)
Post-Mandatory IFRS Year Indicator	0.00846 (1.21)	−0.00301 (−0.22)	−0.0112 (−0.88)		
Public Firm Indicator × Post-Mandatory IFRS Year Indicator	0.437*** (6.72)	0.326** (2.46)	0.276** (2.30)	0.263** (2.33)	0.275** (2.27)
PP&E		−0.118 (−0.93)	−0.337** (−2.04)	−0.262 (−1.52)	−0.346** (−2.06)
Sales Growth		0.0680 (1.07)	0.0185 (0.33)	0.0671 (0.80)	0.0580 (0.69)
Leverage		−0.0592 (−0.56)	−0.0806 (−0.80)	−0.0605 (−0.60)	−0.0735 (−0.73)
Debt Issue		−0.356 (−1.32)	−0.253 (−1.02)	−0.320 (−1.29)	−0.272 (−1.09)
Turnover		−0.00647 (−0.06)	0.0342 (0.30)	0.0339 (0.29)	0.0238 (0.20)
Size		0.0207 (1.66)	0.0639*** (3.82)	0.0508*** (2.92)	0.0636*** (3.66)
Loss Indicator		0.0754 (0.62)	0.0843 (0.86)	0.0843 (0.84)	0.0913 (0.91)
Std(Sales)		0.0714 (0.49)	−0.0906 (−0.55)	−0.0812 (−0.49)	−0.0744 (−0.43)
ROA		−0.455 (−1.14)	−0.558 (−1.49)	−0.448 (−1.21)	−0.571 (−1.51)
Intangible Assets		0.0483 (0.23)	−0.0734 (−0.28)	0.0167 (0.07)	−0.0655 (−0.26)
Industry-Country-Year Measure of M&A Activity		0.310*** (3.91)	0.277*** (3.71)	0.255*** (3.75)	0.277*** (3.82)
Industry-Country-Year Measure of IPO Activity		0.313*** (3.87)	0.335*** (4.33)	0.325*** (4.55)	0.338*** (4.48)
Country Investor Protection Factor		−0.0881** (−2.51)	−0.0343 (−1.24)	−0.0959** (−2.50)	−0.0340 (−1.21)
GAAP Difference Measure		−0.0313*** (−4.00)		−0.0207** (−2.52)	
Constant	0.0455*** (8.50)	0.558*** (3.08)			
Adjusted R-Squared	0.143	0.398	0.555	0.567	0.557
Number of Observations	2417	2417	2417	2417	2417
Standard Errors Clustered By:	No Clustering	Industry	Industry	Industry	Industry
Industry Fixed Effects:	No	No	Yes	Yes	Yes
Country Fixed Effects:	No	No	Yes	No	Yes
Year Fixed Effects:	No	No	No	Yes	Yes
Industry × Country × Year Fixed Effects	No	No	No	No	No

of public firms was successful in capturing market share from the largest private firms, leading to an increase in sales concentration.

Table 8 presents the competition results for the restricted sample. Similar to our main results in Tables 4 and 5, the findings are more pronounced in the restricted sample, consistent with a better identification of IFRS adopters. We find a significant and positive coefficient in all five columns, indicating an increase in sales concentration after mandatory IFRS adoption for industries with relatively more public firms. The results of this supplemental test corroborate our main finding of a market share increase for public firms after the mandatory adoption of IFRS.

#### 4.5. Robustness and additional analyses

##### 4.5.1. IFRS adopter financing levels and underinvestment reduction

We argue that the increase in financial reporting quality following from IFRS adoption results in a lower cost of external capital

**Table 9A**

Impact of IFRS on IFRS Adopter Equity Levels, Matched Sample. This table presents the results from our tests examining the equity levels of public and private firms before and after IFRS. The dependent variable is the difference between the average equity level held by a firm in the pre-IFRS period and the average debt level held by the firm in the post-IFRS period. We estimate the tests below using our matched sample. p-values are two-tailed significance. \*p < 0.10, \*\*p < 0.05, \*\*\*p < 0.010. See Appendix A for variable definitions.

	(1)	(2)	(3)	(4)	(5)	(6)
<b>Full Sample</b>						
Dependent Variable = Change in Equity Levels						
Public Firm Indicator	-0.0508*** (-11.62)	-0.0690*** (-4.64)	-0.0685*** (-4.52)	-0.0685*** (-4.53)	-0.0686*** (-4.52)	-0.0722*** (-8.97)
Post-Mandatory IFRS Year Indicator	0.0221*** (6.86)	0.0224*** (6.30)	0.0215*** (6.31)			
Public Firm Indicator × Post-Mandatory IFRS Year Indicator	0.0593*** (11.26)	0.0630*** (5.15)	0.0637*** (5.64)	0.0629*** (5.53)	0.0631*** (5.58)	0.0731*** (8.59)
PP&E		0.0134 (0.62)	0.0170 (0.78)	0.0175 (0.82)	0.0170 (0.78)	0.0107 (1.01)
Sales Growth		-0.0406*** (-5.26)	-0.0393*** (-5.13)	-0.0420*** (-4.78)	-0.0419*** (-4.79)	-0.0517*** (-6.35)
Leverage		0.0814*** (5.06)	0.0846*** (5.24)	0.0849*** (5.22)	0.0848*** (5.24)	0.0886*** (6.12)
Turnover		-0.0162** (-2.04)	-0.0149* (-1.87)	-0.0147* (-1.87)	-0.0150* (-1.88)	-0.0112*** (-3.67)
Size		-0.00797*** (-2.98)	-0.00811*** (-3.08)	-0.00801*** (-3.12)	-0.00818*** (-3.10)	-0.00745*** (-6.58)
Loss Indicator		-0.00596 (-0.75)	-0.00724 (-0.86)	-0.00761 (-0.90)	-0.00737 (-0.87)	-0.00648 (-1.12)
Std(Sales)		0.0397* (1.92)	0.0454** (2.15)	0.0459** (2.17)	0.0457** (2.16)	0.0417*** (3.85)
ROA		0.149*** (2.78)	0.132** (2.39)	0.133** (2.42)	0.133** (2.42)	0.160*** (4.04)
Intangible Assets		-0.0203 (-1.04)	-0.0213 (-0.98)	-0.0216 (-1.01)	-0.0217 (-1.00)	-0.0136 (-1.54)
Industry-Country-Year Measure of M&A Activity		-0.0239** (-2.13)	-0.0286** (-2.15)	-0.0312** (-2.44)	-0.0298** (-2.33)	
Industry-Country-Year Measure of IPO Activity		-0.0938*** (-2.67)	-0.0935** (-2.17)	-0.0920** (-2.12)	-0.0922** (-2.14)	
Country Investor Protection Factor		-0.000242 (-0.06)	-0.0141 (-1.39)	0.00200 (0.49)	-0.0186 (-1.51)	
GAAP Difference Measure		0.00155 (1.56)		0.00157 (1.58)		
Constant	-0.0265*** (-10.19)	-0.0153 (-0.49)				
Adjusted R-Squared	0.0354	0.0607	0.0974	0.0972	0.0976	0.211
Number of Observations	16,151	16,151	16,151	16,151	16,151	16,151
Standard Errors Clustered By:	No Clustering	Industry	Industry	Industry	Industry	Industry × Country × Year
Industry Fixed Effects:	No	No	Yes	Yes	Yes	No
Country Fixed Effects:	No	No	Yes	No	Yes	No
Year Fixed Effects:	No	No	No	Yes	Yes	No
Industry × Country × Year Fixed Effects	No	No	No	No	No	Yes

for, and a higher level of investment in, IFRS adopting firms. We cannot empirically test the first assumption because cost of capital data are not available for our control group of private firms. However, we can empirically test the second assumption by measuring changes in equity and debt levels around IFRS adoption. To examine the magnitude of debt and equity issuances, we estimate Eq. (3):

$$\begin{aligned}
 \text{Change in Financing} = & \beta_0 + \beta_1 \text{Public Firm Indicator} + \beta_2 \text{Post-Mandatory IFRS Year Indicator} \\
 & + \beta_3 \text{Public Firm Indicator} \times \text{Post-Mandatory IFRS Year Indicator} + \beta_4 \text{PPE} + \beta_5 \text{Sales Growth} \\
 & + \beta_6 \text{Leverage} + \beta_7 \text{Debt Issue} + \beta_8 \text{Turnover} + \beta_9 \text{Size} + \beta_{10} \text{Loss Indicator} + \beta_{11} \text{Std Sales} + \beta_{12} \text{ROA} \\
 & + \beta_{13} \text{Intangible Assets} + \text{Industry Fixed Effects} + \text{Country Fixed Effects} + \text{Year Fixed Effects} + \varepsilon \quad (3)
 \end{aligned}$$

**Table 9B**

Impact of IFRS on IFRS Adopter Debt Levels, Matched Sample. This table presents the results from our tests examining the debt levels of public and private firms before and after IFRS. The dependent variable is the difference between the average debt level held by a firm in the pre-IFRS period and the average debt level held by the firm in the post-IFRS period. We estimate the tests below using our matched sample. p-values are two-tailed significance. \*p < 0.10, \*\*p < 0.05, \*\*\*p < 0.010. See [Appendix A](#) for variable definitions.

	(1)	(2)	(3)	(4)	(5)	(6)
	<b>Full Sample</b>					
	Dependent Variable = Change in Debt Levels					
Public Firm Indicator	−0.135*** (−11.59)	−0.140*** (−5.14)	−0.145*** (−5.13)	−0.148*** (−5.17)	−0.145*** (−5.12)	−0.166*** (−10.34)
Post-Mandatory IFRS Year Indicator	0.0126 (1.32)	−0.00302 (−0.29)	−0.00302 (−0.38)			
Public Firm Indicator × Post-Mandatory IFRS Year Indicator	0.0890*** (5.82)	0.0999*** (5.48)	0.101*** (5.24)	0.106*** (5.50)	0.102*** (5.30)	0.131*** (6.93)
PP&E		−0.0217 (−0.41)	−0.0307 (−0.49)	−0.0294 (−0.46)	−0.0333 (−0.52)	−0.0239 (−0.85)
Sales Growth		0.0206 (0.96)	0.0164 (0.79)	0.0209 (0.91)	0.0230 (0.99)	0.0263 (1.16)
Leverage		−0.0298 (−0.73)	−0.0446 (−0.98)	−0.0461 (−1.01)	−0.0451 (−0.98)	−0.0587* (−1.91)
Turnover		−0.00911 (−0.64)	−0.0133 (−0.90)	−0.0145 (−0.99)	−0.0136 (−0.91)	−0.00163 (−0.20)
Size		0.00326 (0.68)	0.0116* (1.89)	0.0112* (1.85)	0.0119* (1.93)	0.0135*** (4.66)
Loss Indicator		0.0154 (0.70)	0.0164 (0.72)	0.0168 (0.74)	0.0167 (0.74)	0.0183 (1.04)
Std(Sales)		−0.0954** (−2.09)	−0.118** (−2.60)	−0.114** (−2.56)	−0.119** (−2.64)	−0.130*** (−3.48)
ROA		0.269 (1.64)	0.279* (1.68)	0.302* (1.84)	0.277 (1.66)	0.291*** (2.92)
Intangible Assets		0.0777 (1.49)	0.0626 (1.16)	0.0654 (1.19)	0.0617 (1.15)	0.0696*** (2.64)
Industry-Country-Year Measure of M&A Activity		−0.0679 (−1.31)	−0.0597 (−1.15)	−0.0476 (−0.91)	−0.0601 (−1.18)	
Industry-Country-Year Measure of IPO Activity		−0.0238 (−0.27)	−0.0600 (−0.57)	−0.0455 (−0.43)	−0.0504 (−0.47)	
Country Investor Protection Factor		−0.0327** (−2.54)	0.0241 (1.05)	−0.0406*** (−2.99)	0.0308 (1.23)	
GAAP Difference Measure		−0.00158 (−0.53)		−0.00232 (−0.73)		
Constant	0.0221*** (3.18)	0.0818* (1.92)				
Adjusted R-Squared	0.0136	0.0232	0.0503	0.0486	0.0506	0.177
Number of Observations	16,151	16,151	16,151	16,151	16,151	16,151
Standard Errors Clustered By:	No Clustering	Industry	Industry	Industry	Industry	Industry × Country × Year
Industry Fixed Effects:	No	No	Yes	Yes	Yes	No
Country Fixed Effects:	No	No	Yes	No	Yes	No
Year Fixed Effects:	No	No	No	Yes	Yes	No
Industry × Country × Year Fixed Effects	No	No	No	No	No	Yes

*Change in Financing* represents positive net equity issuance in our equity tests and positive net debt issuance in our debt tests.<sup>22</sup> *Change in Financing* is a variable equal to the remainder after subtracting year 2004 levels of equity and debt (scaled by total assets) from the mean value of firm equity and debt in years 2006–2010. We compare financing in 2004 with the average level of financing in all post-IFRS years in our sample because we want to capture changes in capital structure that occur with a lag following IFRS. *Change in Financing* captures the long-term change in equity and debt, and our expectation is that  $\beta_3 > 0$ , consistent with IFRS adopting firms increasing equity and debt levels after IFRS adoption.<sup>23</sup> The estimated coefficients from Eq. (3) are presented in [Tables 9A and 9B](#). The coefficient on the *Public Firm Indicator* × *Post-Mandatory IFRS Year Indicator* interaction is positive and significant across all specifications in both tables, suggesting that adopting firms increased their levels of equity and debt in the post-IFRS period. Taken together, the results from [Tables 9A and 9B](#) corroborate our argument that IFRS adopters exploited greater access to debt and equity to gain market share after IFRS adoption.

<sup>22</sup> We acknowledge that there can be plenty of events affecting the level of equity (e.g., retained earnings, share repurchases). It might therefore be less straightforward to attribute the change in equity level to the decrease in cost of capital after IFRS adoption than in the case of debt.

<sup>23</sup> We acknowledge that this measure will capture new debt issuances with noise, but the data to measure new debt issuances are not available. This measure is similar to the debt issuance measures used in [Naranjo et al. \(2018\)](#) and [Godsell et al. \(2017\)](#), who also examine EU data.

**Table 10A**

Impact of IFRS Adopter Change in Equity Levels on IFRS Adopter Market Share, Matched Sample. This table presents the estimated coefficients from Eq. (1) to test our hypotheses at the firm-level using a matched sample. The matched sample is restricted to the restricted sample. Each public firm is matched to a private firm based on country, industry, year and a  $\pm 5\%$  size caliper. The dependent variable is the firm-year market share calculated as firm sales divided by total sales within the SIC4-Year group. p-values are two-tailed significance. \*p < 0.10, \*\*p < 0.05, \*\*\*p < 0.010. See Appendix A for variable definitions.

	Restricted Sample Dependent Variable = Market Share			
	10% Threshold	20% Threshold	30% Threshold	40% Threshold
Public Firm Indicator	−0.00639*** (−6.23)	−0.00571*** (−5.62)	−0.00538*** (−5.28)	−0.00539*** (−5.32)
Increase in Financing Indicator	−0.00408*** (−2.76)	−0.000207 (−0.07)	0.0123** (5.70)	0.0211*** (6.80)
Public Firm Indicator × Post-Mandatory IFRS Year Indicator	0.00250* (1.69)	0.00251* (1.74)	0.00251* (1.76)	0.00260* (1.83)
Public Firm Indicator × Increase in Financing Indicator	0.00591*** (2.87)	0.00249 (0.80)	−0.0114*** (−3.19)	−0.0193*** (−3.29)
Post-Mandatory IFRS Year Indicator × Increase in Financing Indicator	−0.00175 (−0.88)	−0.00304 (−0.84)	−0.00971*** (−2.59)	−0.0186*** (−3.31)
Public Firm Indicator × Post-Mandatory IFRS Year Indicator × Increase in Financing Indicator	0.00152 (0.56)	0.00472 (1.18)	0.0159*** (3.11)	0.0279*** (3.50)
Property, Plant & Equipment	0.00441** (2.54)	0.00455*** (2.62)	0.00466*** (2.68)	0.00474*** (2.73)
Sales Growth	−0.000269 (−0.19)	−0.000222 (−0.16)	−0.000195 (−0.14)	−0.000221 (−0.16)
Turnover	−0.00546*** (−3.70)	−0.00558*** (−3.83)	−0.00556*** (−3.83)	−0.00573*** (−3.96)
Size	0.00931*** (11.84)	0.00930*** (11.80)	0.00931*** (11.78)	0.00930*** (11.86)
Accruals	0.0162*** (26.08)	0.0162*** (26.09)	0.0163*** (26.07)	0.0163*** (26.30)
Loss Indicator	0.00148 (1.40)	0.00133 (1.27)	0.00135 (1.28)	0.00139 (1.32)
Std(Sales)	0.00730*** (3.76)	0.00709*** (3.62)	0.00688*** (3.54)	0.00710*** (3.63)
Return on Assets	0.00497 (0.86)	0.00402 (0.69)	0.00499 (0.86)	0.00519 (0.89)
Intangibles	0.00719*** (3.98)	0.00712*** (3.93)	0.00708*** (3.89)	0.00702*** (3.85)
Adjusted R-Squared	0.691	0.690	0.690	0.690
Number of Observations	16,151	16,151	16,151	16,151
Standard Errors Clustered By:	Industry × Country × Year	Industry × Country × Year	Industry × Country × Year	Industry × Country × Year
Industry Fixed Effects:	No	No	No	No
Country Fixed Effects:	No	No	No	No
Year Fixed Effects:	No	No	No	No
Industry × Country × Year Fixed Effects	Yes	Yes	Yes	Yes

We next examine whether the increase in IFRS adopter market share that we observe in our main tests accrues more to those firms that issue more new equity and debt. This outcome would be consistent with the notion that IFRS increases the level of financing available to mandatory adopters and that mandatory adopters use this financing to increase market share.

We find that larger gains in market share appear to accrue to firms issuing more equity and debt after IFRS adoption. To examine the market share changes accruing to firms with various levels of change in equity and debt in the post-IFRS period, we re-estimate Eq. (1) after adding a new variable, *Increase in Financing Indicator*. This variable is equal to one when firms' net change in equity or debt exceeds 10%, 20%, 30% or 40% of total assets, and we report these results in columns (1) to (4) of Table 10A (equity) and 10B (debt), respectively. We interact this variable with our test variable, *Public Firm Indicator × Post-Mandatory IFRS Year Indicator*, to determine if market share gains accrue primarily to public firms that issue more equity and debt in the post-IFRS period. We find that

**Table 10B**

Impact of IFRS Adopter Change in DEbt Levels on IFRS Adopter Market Share, Matched Sample. This table presents the estimated coefficients from Eq. (1) to test our hypotheses at the firm-level using a matched sample. The matched sample is restricted to the restricted sample. Each public firm is matched to a private firm based on country, industry, year and a  $\pm 5\%$  size caliper. The dependent variable is the firm-year market share calculated as firm sales divided by total sales within the SIC4-Year group. p-values are two-tailed significance. \*p < 0.10, \*\*p < 0.05, \*\*\*p < 0.010. See Appendix A for variable definitions.

	(1)	(2)	(3)	(4)
	<b>Restricted Sample</b>			
	Dependent Variable = Market Share			
	10% Threshold	20% Threshold	30% Threshold	40% Threshold
Public Firm Indicator	-0.00398*** (-3.91)	-0.00401*** (-3.98)	-0.00433*** (-4.41)	-0.00500*** (-5.03)
Increase in Financing Indicator	0.00283* (1.77)	0.00352* (1.84)	0.00458** (2.09)	0.00219 (0.89)
Public Firm Indicator × Post-Mandatory IFRS Year Indicator	0.00228 (1.54)	0.00237* (1.65)	0.00233* (1.66)	0.00211 (1.49)
Public Firm Indicator × Increase in Financing Indicator	-0.00743*** (-3.63)	-0.0113*** (-4.91)	-0.0106*** (-4.00)	-0.00661** (-2.20)
Post-Mandatory IFRS Year Indicator × Increase in Financing Indicator	-0.000116 (-0.05)	-0.0000267 (-0.01)	-0.00211 (-0.68)	-0.00516 (-1.53)
Public Firm Indicator × Post-Mandatory IFRS Year Indicator × Increase in Financing Indicator	0.00415 (1.46)	0.00589* (1.79)	0.00575 (1.58)	0.00736* (1.82)
Property, Plant & Equipment	0.00432** (2.52)	0.00436** (2.52)	0.00450*** (2.60)	0.00476*** (2.76)
Sales Growth	-0.000107 (-0.08)	-0.000116 (-0.08)	-0.000129 (-0.09)	-0.000286 (-0.20)
Turnover	-0.00600*** (-4.09)	-0.00564*** (-3.87)	-0.00552*** (-3.75)	-0.00500*** (-3.41)
Size	0.00923*** (11.73)	0.00915*** (11.78)	0.00919*** (11.79)	0.00921*** (11.80)
Accruals	0.0162*** (26.30)	0.0161*** (26.17)	0.0161*** (26.04)	0.0162*** (26.10)
Loss Indicator	0.00136 (1.29)	0.00137 (1.31)	0.00140 (1.33)	0.00140 (1.32)
Std(Sales)	0.00700*** (3.61)	0.00682*** (3.53)	0.00701*** (3.65)	0.00728*** (3.78)
Return on Assets	0.00464 (0.80)	0.00508 (0.88)	0.00499 (0.86)	0.00508 (0.87)
Intangibles	0.00679*** (3.77)	0.00688*** (3.84)	0.00708*** (3.95)	0.00739*** (4.13)
Adjusted R-Squared	0.691	0.691	0.691	0.690
Number of Observations	16,151	16,151	16,151	16,151
Standard Errors Clustered By:	Industry × Country × Year	Industry × Country × Year	Industry × Country × Year	Industry × Country × Year
Industry Fixed Effects:	No	No	No	No
Country Fixed Effects:	No	No	No	No
Year Fixed Effects:	No	No	No	No
Industry × Country × Year Fixed Effects	Yes	Yes	Yes	Yes

this is indeed the case.

In Table 10A, we report that firms issuing new equity appear to gain market share in the post-IFRS period; we find that market share gains accrue to firms that issue large amounts of equity (> 30% of total assets) in the post-IFRS period. Across the four thresholds, we observe a monotonic increase in the market share accruing to those firms that issue more equity.

We report the tests examining changes in debt in Table 10B. In Table 10B, we also observe a monotonic increase, this time in the market share accruing to firms that issue larger amounts of debt. Market share gains increase as we restrict our new variable, *Increase in Financing Indicator*, to capture only those firms with ever-larger debt issuance. Together, the results from Tables 9A–10B corroborate our argument that IFRS adopters exploited increased access to debt to increase market share.

To more tightly link adopters' increased levels of financing to market share, we next turn to tests examining the type of firms most

**Table 11**

Impact of IFRS on Investment Efficiency, Matched Sample. This table examines the effect of IFRS on investment efficiency. Investment efficiency is calculated using Eq. (4). The model estimated in column 1 is described in Eq. (5). Column 2 restrict the sample to firms characterized as over-investing before IFRS adoption while column 3 restricted the same to firms characterized as under-investing before IFRS adoption. Each public firm in our sample is matched to a private firm based on country, industry, year and a  $\pm$  5% size threshold. p-values are two-tailed significance. \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.010. See Appendix A for variable definitions.

	(1)	(2)	(3)
	Matched Sample		
	Abnormal Investment	Overinvestment	Underinvestment
Public Firm Indicator	−7.905*** (−4.14)	−6.578*** (−3.83)	−4.428* (−1.84)
Public Firm Indicator × Post-Mandatory IFRS Year Indicator	−6.551** (−2.33)	−2.325 (−0.92)	−7.296** (−2.12)
Size	24.01*** (25.87)	18.48*** (23.97)	17.60*** (16.25)
Tangibility	80.50*** (17.22)	68.73*** (16.37)	51.43*** (7.45)
Slack	1.026*** (5.14)	0.685*** (3.51)	0.653** (2.51)
Leverage	5.877*** (4.20)	3.841*** (3.22)	4.131** (2.35)
CF_Sale	43.85*** (4.88)	21.51*** (2.58)	43.00*** (3.71)
Loss Indicator	8.128*** (4.56)	3.538** (1.99)	12.32*** (5.70)
Accruals	2.345 (0.41)	−8.927* (−1.70)	22.22*** (2.98)
Std (Sales)	23.85*** (6.19)	21.26*** (5.62)	19.44*** (3.94)
Std (Cash Flows)	11.42*** (2.72)	11.45*** (2.90)	3.288 (0.64)
Adjusted R-Squared	0.593	0.710	0.669
Number of Observations	16,151	7798	8353
Standard Errors Clustered By:	Industry × Country × Year	Industry × Country × Year	Industry × Country × Year
Industry Fixed Effects:	No	No	No
Country Fixed Effects:	No	No	No
Year Fixed Effects:	No	No	No
Industry × Country × Year Fixed Effects	Yes	Yes	Yes

likely to exploit new access to financing. We analyze whether the new capital is spent efficiently by investigating investment efficiency. Conceptually, investment efficiency refers to managers investing in all (and only) positive NPV projects (Tobin, 1969). Firms that under- or over-invest relative to their growth opportunity set are argued to invest inefficiently. If the set of positive NPV projects is the same across firms in an industry, firms that underinvest relative to industry peers may be foregoing positive NPV projects. Financial constraints exacerbate underinvestment. Therefore, in our setting, we expect IFRS adoption to alleviate underinvestment for adopters as they have increased access to capital after the mandatory adoption. This new capital can be invested in positive NPV projects.<sup>24</sup> To provide in-sample evidence that managers efficiently allocate external capital, we follow Biddle et al. (2009), who predict the optimal investment level for a firm. Biddle et al. (2009) use a model that predicts investment as a function of growth opportunities. Underinvestment (overinvestment) is classified based on negative (positive) deviations from expected investment. Chen et al. (2013) use a similar model with private firms. We follow their model because our sample also includes private firms.

$$Investment = \alpha_0 + \alpha_1 Negative + \alpha_2 \%Rev Growth + \alpha_3 Negative \times \%Rev Growth + \varepsilon \quad (4)$$

*Investment* is the sum of new investment in machinery, equipment, vehicles, land, buildings, and research and development expenditures, less the sale of fixed assets and scaled by lagged total assets. *%RevGrowth* is the annual revenue growth rate. The indicator variable *Negative* takes the value of 1 for negative revenue growth and 0 otherwise and is included to allow for differential predictability for revenue increases and revenue decreases. We estimate Eq. (4) by industry-year and use the residuals to create a variable that measures the level of investment efficiency. Specifically, the absolute value of the residuals from Eq. (4) is equal to *Abnormal Investment*, the positive values are equal to *Overinvestment* and the absolute value of the negative residuals is equal to *Underinvestment*. We then use these investment efficiency variables as the dependent variable in the model below.

<sup>24</sup> The effect of increased access to capital on overinvestment is more ambiguous. Overinvesting firms have more access to capital, which may spur further overinvestment, but IFRS adoption may increase transparency and allow capital providers to restrict the capital provided, which may attenuate overinvestment. These arguments are made elsewhere (e.g., Chen et al., 2013; Biddle et al., 2016); however, we are predominantly interested in the effect of increased access to capital on IFRS adopters' propensity to underinvest.

**Table 12**

Impact of IFRS on IFRS Adopter Market Share, Voluntary versus Mandatory Adopters. This table presents the estimated coefficients from Eq. (1) to test our hypotheses at the firm-level after excluding firms in countries that permitted early or deferred adoption. This sample includes only public firms (treatment) and voluntary adopters (control). The dependent variable is the firm-year market share calculated as firm sales divided by total sales within the SIC4-Year group. p-values are two-tailed significance. \*p < 0.10, \*\*p < 0.05, \*\*\*p < 0.010. See Appendix A for variable definitions.

	(1)	(2)	(3)	(4)	(5)	(6)
<b>Sample of Mandatory and Voluntary Adopters Only</b>						
Dependent Variable = Market Share						
Mandatory Adopter Firm Indicator	-0.0122*** (-3.15)	-0.00966** (-2.10)	-0.00781** (-2.00)	-0.0102** (-2.46)	-0.0106** (-2.46)	-0.0146*** (-4.93)
Post-Mandatory IFRS Year Indicator	-0.00522** (-2.19)	-0.00569 (-1.44)		-0.0663 (-0.00)		
Mandatory Adopter Firm × Post-Mandatory IFRS Year Indicator	0.0186*** (3.81)	0.0161** (2.37)	0.00983** (2.08)	0.0144** (2.38)	0.0145** (2.43)	0.0143*** (3.39)
PP&E		0.00560 (0.28)	-0.00606 (-0.46)	-0.0113 (-0.88)	-0.0101 (-0.77)	-0.0209*** (-2.71)
Sales Growth		-0.00556* (-1.75)	-0.00153 (-0.54)	-0.000531 (-0.17)	-0.000608 (-0.19)	0.00393 (1.37)
Leverage		0.0241** (2.27)	0.0117* (1.75)	0.0115* (1.71)	0.0116* (1.74)	0.0140*** (2.90)
Debt Issue		-0.0315 (-1.45)	0.000469 (0.04)	0.000252 (0.02)	0.000536 (0.04)	0.00644 (0.71)
Turnover		0.0195 (1.34)	0.00677 (0.76)	0.00589 (0.66)	0.00582 (0.65)	-0.00817** (-2.36)
Size		0.00231 (1.30)	0.00176 (1.37)	0.00173 (1.31)	0.00182 (1.41)	0.00192*** (2.70)
Loss Indicator		0.000314 (0.10)	-0.00194 (-0.53)	-0.00201 (-0.54)	-0.00238 (-0.65)	0.000116 (0.04)
Std(Sales)		-0.0102 (-1.27)	-0.00703 (-1.26)	-0.00820 (-1.41)	-0.00790 (-1.37)	-0.00107 (-0.35)
ROA		0.0164 (0.89)	-0.00435 (-0.25)	-0.00206 (-0.12)	-0.00220 (-0.13)	0.00640 (0.61)
Intangible Assets		0.00194 (0.11)	0.00752 (0.59)	0.00771 (0.60)	0.00764 (0.59)	-0.0165** (-2.29)
Industry-Country-Year Measure of M&A Activity		0.513*** (31.62)	0.436*** (8.27)	0.435*** (8.20)	0.436*** (8.30)	
Industry-Country-Year Measure of IPO Activity		0.197*** (3.04)	0.187*** (2.77)	0.189*** (2.79)	0.189*** (2.79)	
Country Investor Protection Factor		-0.0000293 (-0.01)	0.00211 (0.38)	0.000515 (0.17)		
GAAP Difference Measure		0.000295 (0.51)		0.000277 (0.47)		
Constant	0.0274*** (15.19)	0.00158 (0.13)				
Adjusted R-Squared	0.00146	0.155	0.333	0.335	0.335	0.498
Number of Observations	10,056	10,056	10,056	10,056	10,056	10,056
Standard Errors Clustered By:	No Clustering	Industry	Industry	Industry	Industry	Industry × Country × Year
Industry Fixed Effects:	No	No	Yes	Yes	Yes	No
Country Fixed Effects:	No	No	Yes	No	Yes	No
Year Fixed Effects:	No	No	No	Yes	Yes	No
Industry × Country × Year Fixed Effects	No	No	No	No	No	Yes

$$\begin{aligned}
\text{Abnormal Investment} = & \gamma_0 + \gamma_1 \text{Public Firm Indicator} + \gamma_2 \text{Post-Mandatory IFRS Year Indicator} \\
& + \gamma_3 \text{Public Firm Indicator} \times \text{Post-Mandatory IFRS Year Indicator} + \gamma_4 \text{Size} + \gamma_5 \text{Tangibility} \\
& + \gamma_6 \text{Slack} + \gamma_7 \text{Leverage} + \gamma_8 \text{CF\_Sale} + \gamma_9 \text{Loss Indicator} + \gamma_{10} \text{Accruals} + \gamma_{11} \text{Std(Sales)} \\
& + \gamma_{12} \text{Std(Cash Flows)} + \text{Industry Fixed Effects} + \text{Country Fixed Effects} + \text{Year Fixed Effects} + \varepsilon \quad (5)
\end{aligned}$$

Public Firm Indicator, Post-Mandatory IFRS Year Indicator, Size, Leverage, Loss Indicator and Std(Sales) are defined above. Abnormal Investment takes the value of one of the three investment efficiency measures described above. Tangibility is the ratio of property, plant and equipment to total assets. Slack is the ratio of cash to total assets. CF\_Sale is the ratio of cash flows to sales. Std(Cash Flows) is equal to the standard deviation of cash flows from period  $t - 4$  to  $t$ . Accruals is calculated as follows:

$$\text{Accruals} = \Delta \text{Current Assets} - \Delta \text{Cash} - \Delta \text{Current Liabilities} + \Delta \text{Short-term Debt} + \Delta \text{Current Taxes} - \text{Depreciation} \quad (6)$$

We report estimated coefficients from Eq. (5) in Table 11. We use a matched sample to alleviate the concern that our results are

driven by an omitted variable correlated with both public firm status and investment efficiency. The dependent variables in columns (1) through (3) are *Abnormal Investment*, *Overinvestment* and *Underinvestment*, respectively. The coefficient on the interaction *Public Firm Indicator*  $\times$  *Post-Mandatory IFRS Year Indicator* is negative and significant when the dependent variable is *Abnormal Investment* and *Underinvestment*. This provides evidence that managers of public firms required to adopt IFRS reduce their abnormal investment following the adoption. This is consistent with prior literature and provides support for our assumption that managers use external capital efficiently in the years following IFRS adoption. Further, the result that *Underinvestment* is reduced for IFRS firms provides further support to our argument that IFRS facilitates investment in new positive NPV projects after IFRS adoption. A statistically insignificant coefficient on *Overinvestment* suggests that reduced financing frictions after IFRS do not increase myopic investment.

#### 4.5.2. Public voluntary adopter control group

In section 4.3 above, we use a matched sample where the public firms are the treatment group and matched private firms are the control group. An alternative research design choice is to remove all private firms and use public firm voluntary adopters (identified from Daske et al. (2013) as the control group. Voluntary adopters are an interesting alternative control group because voluntary adopters are likely to share many firm characteristics with mandatory adopters (e.g., legal status) while being less affected by the financial reporting changes spurred by mandatory IFRS adoption. A disadvantage is that, to the extent that concurrent enforcement changes drive the market share effects we observe, we should discern fewer differences in market share changes between voluntary and mandatory adopters because enforcement changes affect both groups similarly. Nonetheless, we restrict the restricted sample of firms to public firms only and designate mandatory (voluntary) adopters as the treatment (control) group. We identify public voluntary adopters using the Daske et al. (2013) voluntary adopter list.

We report the results of this analysis in Table 12. The dependent variable is firm market share. Consistent with the prior evidence, the coefficient on the interaction between *Public Firm Indicator*  $\times$  *Post-Mandatory IFRS Year Indicator* is positive and significant in all columns. This evidence further corroborates our main finding. Overall, using this alternate control group, we find further evidence corroborating earlier findings of increased market share for mandatory IFRS adopters following IFRS adoption.

#### 4.5.3. Other robustness tests

In addition to those presented, we perform several untabulated robustness tests to confirm our results. First, we examine whether the product market effects are concentrated in countries that concurrently adopted new enforcement measures and find that our results are strongest in this subgroup of countries. Second, we re-estimate column 6 of Tables 4 and 5 after sequentially dropping each individual country, year and Fama French (10) industry for the full and restricted sample. Our results are generally insensitive to these exclusions in the full sample and do not deviate from our reported results in the restricted sample. Finally, we re-estimate column 6 of Tables 4 and 5 after removing observations within industry-year clusters without any public firms. Results remain similar to those presented.

## 5. Conclusion

We find that changes in financial reporting regulation are linked to public firms' market share and product market competition. We document a positive association between financial reporting regulation and public firms' market share and a negative association between financial reporting regulation and product market competition. The results are most salient in our restricted subsample, which excludes those countries that did allow early or late adoption and also excludes voluntary adopters. Supplemental analysis provide support for the underlying assumption that the market share increase is driven by increased access to financing and increased investment efficiency.

Our cross-country study faces many limitations. As discussed by Bushman and Smith (2001) and Levine and Renelt (1992), there are no generally accepted theories of competition that offer researchers an exhaustive list of control variables with which to specify the regression model; as a result, omitted variable bias is a genuine concern in our study. It is possible that the relations observed in this paper could be spurious, caused by an unobserved variable affecting accounting regime change and competition. Second, as discussed by Bushman and Smith (2001), the explanatory variables are highly correlated and measured with error with regression coefficients often sensitive to the set of control variables included (Levine and Renelt, 1992).

Two additional caveats relate to our use of IFRS and concurrent enforcement actions as an exogenous change in the information environment. First, consistent with recent and contemporaneous literature exploiting IFRS adoption as an exogenous change in firms' information environment, we do not assert that IFRS adoption singularly drives EU firm financial reporting changes around the time of adoption. We follow this prior literature in using IFRS adoption as a proxy for a basket of concurrent regulatory actions that tightened enforcement of firm financial reporting.<sup>25</sup> Examples of recent studies exploiting IFRS adoption as an exogenous change in firms' information environments include Hail et al. (2014), Naranjo et al. (2018), Ozkan et al. (2012), and Loureiro and Taboada (2015).

Second, we provide only modest evidence of the mechanisms driving the change in the access to capital documented in Naranjo et al. (2018) and Florou and Kosi (2015). For example, we cannot observe and control for firm heterogeneity in financial reporting or

<sup>25</sup> We note that the suite of regulatory actions concurrent with IFRS adoption applied largely to public firms such that similar effects would not necessarily be observed for private firms that adopt IFRS. However, to our knowledge, financing consequences for private firms that adopt IFRS is an open empirical question. As discussed above, improved access to financing for private IFRS adopters works against our hypotheses.

the presence of various information intermediaries or determinants that may affect financial reporting or the information environment. This limitation, which is common to studies exploiting IFRS as an exogenous change in the information environment, is compounded in our setting, which includes a sample predominantly populated by private firms.

Finally, we cannot rule out other possible drivers of competitive behavior related to a decrease in information asymmetry. Other plausible channels, however, are spurred by an exogenous change in the information asymmetry between managers and investors, which is our object of interest. We encourage future research to overcome these limitations and further extend our understanding of the product market effects of financial reporting regulation.

## Appendix A. Variable definitions

This appendix presents the variable definitions for all variables used in the study.

Variable Name	Definition
Market Share	Individual firm sales divided by the sum of sales at the industry-year level per SIC4 code
Herfindahl Index	The sum of market share squared for each country, industry, year pairing
Public Firm Indicator	Indicator variable set equal to 1 when the firm has market price data available, set equal to zero otherwise
Post-Mandatory IFRS Year Indicator	Indicator variable set equal to 1 when the fiscal year is 2005 or later, set equal to zero otherwise
PPE	Total property, plant and equipment scaled by total assets
Sales Growth	Sales in period $t$ minus sales in period $t - 1$ scaled by sales in period $t - 1$
Leverage	Total firm debt scaled by total book value of equity
Debt Issue Turn	Current liabilities plus long-term liabilities scaled by average assets
Size	Total sales scaled by total assets
Accruals	$\Delta \text{Current Assets} - \Delta \text{Cash} - (\Delta \text{Current Liabilities} - \Delta \text{Short-term Debt} - \Delta \text{Taxes Payable}) - \text{Depreciation}$
Loss	Indicator variable set equal to 1 when the firm reports negative net income, set equal to zero otherwise
Std(Sales)	Standard deviation of sales for the period $t - 4$ to $t$
ROA	Net income scaled by total assets
Intangibles	Intangible assets scaled by total sales
Industry-Country-Year Measure of M&A Activity	The no. of mergers/acquisitions in an industry-country-year group divided by the no. of firms within the group
Industry-Country-Year Measure of IPO activity	The no. of initial public offerings in an industry-country-year group divided by the no. of firms within the group
Tangibility	Total property, plant and equipment scaled by total assets
Slack	Cash flows scaled by total assets
CF_Sale	Cash flows scaled by sales
Std(Cash Flows)	Standard deviation of cash flows for the time period $t - 4$ to $t$
Change in Financing	Either equity or debt: mean value of firm leverage (equity) in years 2006 to 2010 minus value of firm leverage (equity) in year 2004

## References

- Ahmed, A., Neel, M., Wang, D., 2013. Does mandatory adoption of IFRS improve accounting quality? Preliminary evidence. *Contemp. Acc. Res.* 30 (4), 1344–1372.
- Ali, A., Klasa, S., Yeung, E., 2009. The limitations of industry concentration measures constructed with compustat data: implications for finance research. *Rev. Financ. Stud.* 22 (10), 3839.
- Alimov, A., 2016. Product market effects of real estate collateral. *J. Corporate Fin.* 36, 75–92.
- Anderson, M., Banker, R., Janakiraman, S., 2003. Are selling, general and administrative costs 'sticky'? *J. Acc. Res.* 41, 47–63.
- Armstrong, C., Guay, W., Weber, J., 2010. The role of information and financial reporting in corporate governance and debt contracting. *J. Acc. Econ.* 50 (2), 179–234.
- Aslan, H., Kumar, P., 2016. The product market effects of hedge fund activism. *J. Financ. Econ.* 119, 226–248.
- Atwood, T.J., Drake, M.S., Myers, J.N., Myers, L.A., 2011. Do earnings reported under IFRS tell us more about future earnings and cash flows? *J. Acc. Public Policy* 30 (2), 103–121.
- Aussilloux, V., Bénassy-Quéré, A., Fuest, C., Wolff, G., 2017. Making the best of the European single market. *Bruegel Policy Contribution Issue No. 3/2017*.
- Bae, K., Hongping, T., Welker, M., 2008. International GAAP differences: the impact on foreign analysts. *Acc. Rev.* 83 (3), 593–628.
- Balakrishnan, K., Core, J., Verdi, R., 2014. The relation between reporting quality and financing and investment: evidence from changes in financing capacity. *J. Acc. Res.* 52 (1), 1–36.
- Ball, R., Li, X., Shivakumar, L., 2015. Contractibility and transparency of financial statement information prepared under IFRS: evidence from debt contracts around IFRS adoption. *J. Acc. Res.* 53 (5), 915–963.

- Benoit, J., 1984. Financially constrained entry in a game with incomplete information. *Rand J. Econ.* 15, 490–499.
- Berger, P., Hann, R., 2007. Segment profitability and the proprietary and agency costs of disclosure. *Acc. Rev.* 82, 869–906.
- Bertrand, M., Mullainathan, S., 2003. Enjoying the quiet life? Corporate governance and managerial preferences. *J. Political Econ.* 111 (5), 1043–1075.
- Biddle, G., Callahan, C., Hong, H., Knowles, R., 2016. Do adoptions of international financial reporting standards enhance capital investment efficiency? Working paper. University of Melbourne.
- Biddle, G., Hillary, G., Verdi, R., 2009. How does financial reporting relate to investment efficiency? *J. Account. Econ.* 48 (3), 112–131.
- Bolton, P., Scharfstein, D., 1990. A theory of predation based on agency problems in financial contracting. *Am. Econ. Rev.* 80, 93–106.
- Botosan, C., Stanford, M., 2005. Managers' motives to withhold segment disclosures and the effect of SFAS No. 131 on analysts' information environment. *Acc. Rev.* 80, 751–771.
- Brown, A., 2016. Institutional differences and international private debt markets: a test using Mandatory IFRS adoption. *J. Acc. Res.* 54, 679–723.
- Bruggemann, U., Hitz, J.-M., Sellhorn, T., 2013. Intended and unintended consequences of mandatory IFRS adoption: a review of extant evidence and suggestions for future research. *Eur. Acc. Rev.* 22 (1), 1–37.
- Bushman, R., Landsman, W., 2010. The pros and cons of regulating corporate reporting: a critical review of the arguments. *Acc. Bus. Res.* 40 (3), 259–273.
- Bushman, R., Smith, A., 2001. Financial accounting information and corporate governance. *J. Acc. Econ.* 32, 237–333.
- Cameran, M., Campa, D., Pettinicchio, A., 2014. IFRS adoption among private companies: impact on earnings quality. *J. Acc. Auditing Finance* 29, 279–305.
- Campello, M., 2006. Debt financing: does it boost or hurt firm performance in product markets? *J. Financ. Econ.* 82, 135–172.
- Chen, T., Chin, C., Wang, S., Yao, C., 2015. The effect of mandatory IFRS adoption on bank loan contracting. *J. Int. Acc. Res.* 14, 45–81.
- Chen, C., Young, D., Zhuang, Z., 2013. Externalities of mandatory IFRS adoption: evidence from cross-border spillover effects of financial information on investment efficiency. *Acc. Rev.* 88 (3), 881–894.
- Chevalier, J., 1995. Capital structure and product-market competition: empirical evidence from the supermarket industry. *Am. Econ. Rev.* 85, 415–435.
- Christensen, H., Hail, L., Leuz, C., 2013. Mandatory IFRS reporting and changes in enforcement. *J. Acc. Econ.* 56, 147–177.
- Darrrough, M., 1993. Disclosure policy and competition: cournot vs. Bertrand. *Acc. Rev.* 68, 534–561.
- Daske, H., Hail, L., Leuz, C., Verdi, R., 2008. Mandatory IFRS reporting around the world: early evidence on economic consequences. *J. Acc. Res.* 46 (5), 1085–1142.
- Daske, H., Hail, L., Leuz, C., Verdi, R., 2013. Adopting a label: heterogeneity in the economic consequences around IAS/IFRS adoptions. *J. Acc. Res.* 51 (3), 495–547.
- DeFond, M., Hu, X., Hung, M., Li, S., 2011. The impact of mandatory IFRS adoption on foreign mutual fund ownership: the role of comparability. *J. Acc. Econ.* 51 (3), 240–258.
- DeFond, M., Hu, X., Hung, M., Li, S., 2012. Has the widespread adoption of IFRS reduced U.S. firms' attractiveness to foreign investors? *J. Int. Acc. Res.* 11 (2), 27–55.
- Diamond, D., 1989. Reputation acquisition in debt markets. *J. Political Econ.* 97 (4), 828–862.
- Doukakis, L.C., 2014. The effect of mandatory IFRS adoption on real and accrual-based earnings management activities. *J. Acc. Public Policy* 33 (6), 551–572.
- Dye, R., 1990. Mandatory versus voluntary disclosures: the cases of financial and real externalities. *Acc. Rev.* 65 (1), 1–24.
- Easley, D., O'Hara, M., 2004. Information and the cost of capital. *J. Finance* 59 (4), 1553–1583.
- Florou, A., Kosi, U., 2015. Does mandatory IFRS adoption facilitate debt financing? *Rev. Acc. Stud.* 20, 1047–1456.
- Florou, A., Kosi, U., Pope, P., 2017. Are international accounting standards more credit relevant than domestic standards? *Acc. Bus. Res.* 47 (1), 1–29.
- Florou, A., Pope, P., 2012. Mandatory IFRS adoption and institutional investment decisions. *Acc. Rev.* 87 (6), 1993–2025.
- Francis, J., LaFond, R., Olsson, P.M., Schipper, K., 2005. The market pricing of accruals quality. *J. Acc. Econ.* 39 (2), 295–327.
- Fresard, L., 2010. Financial strength and product market behavior: the real effects of corporate cash holdings. *J. Finance* 65, 1097–1122.
- Godsell, D., Welker, M., Zhang, N., 2017. Earnings management during antidumping investigations in Europe: sample-wide and cross-sectional evidence. *J. Acc. Res.* 55 (2), 407–457.
- Hail, L., Tahoun, A., Wang, C., 2014. Dividend payouts and information shocks. *J. Acc. Res.* 52 (2), 403–456.
- Harris, M., 1998. The association between competition and managers' business segment reporting decisions. *J. Acc. Res.* 36, 111–128.
- He, J., Huang, J., 2017. He and Huang, forthcoming. Product market competition in a world of cross ownership: evidence from institutional blockholdings. *Rev. Financ. Stud.* 30 (8), 2674–2718.
- Healy, P.M., Palepu, K.G., 2001. Information asymmetry, corporate disclosure, and the capital markets: a review of the empirical disclosure literature. *J. Acc. Econ.* 31, 495–1440.
- Hong, H., Hung, M., Lobo, G., 2014. The impact of mandatory IFRS adoption on IPOs in global capital markets. *Acc. Rev.* 89 (4), 1365–2139.
- Hope, O.-K., Thomas, W., 2008. Managerial empire building and financial disclosure. *J. Acc. Res.* 46 (3), 591–626.
- Jaffee, D., Russell, T., 1976. Imperfect information, uncertainty and credit rationing. *Q. J. Econ.* 90 (4), 651–666.
- Januszewski, S., Köke, J., Winter, J., 2002. Product market competition, corporate governance and firm performance: an empirical analysis for Germany. *Res. Econ.* 56 (3), 299–332.
- Jeanjean, T., Stolowy, H., 2008. Do accounting standards matter? An exploratory analysis of earnings management before and after IFRS adoption. *J. Acc. Public Policy* 27, 480–494.
- Jong, A., Huijgen, C., Marra, T., Roosenboom, P., 2012. Why do firms go public? The role of the product market. *J. Bus. Finance Acc.* 1 & 2, 165–192.
- Jorgensen, D., Siebert, C., 1968. A comparison of alternative theories of corporate investment behavior. *Am. Econ. Rev.* 58 (4), 681–712.
- Kaiser, H., 1960. The application of electronic computers to factor analysis. *Educ. Psychol. Measur.* 20, 141–151.
- Kaufmann, D., Kraay, A., Mastruzzi, M., 2009. Governance Matters VIII: Governance Indicators for 1996–2008. World Bank Policy Research, Washington, D.C.
- Krishnan, K., Nandy, D., Puri, M., 2014. Does financing spurt small business productivity? Evidence from a natural experiment. *Rev. Financ. Stud.* 28, 1768–1809.
- La Porta, R., Lopez-De-Silanes, F., Shleifer, A., Vishny, R., 2002. Investor protection and corporate valuation. *J. Finance* 57 (3), 1147–1170.
- Lambert, R., Leuz, C., Verrecchia, R., 2007. Accounting information, disclosure and the cost of capital. *J. Acc. Res.* 45, 385–420.
- Landsman, W.R., 2007. Is fair value accounting information relevant and reliable? Evidence from capital market research. *Acc. Bus. Res.* 37 (1), 19–30.
- Landsman, W.R., Maydew, E.L., Thornock, J.R., 2012. The information content of annual earnings announcements and mandatory adoption of IFRS. *J. Acc. Econ.* 53, 34–54.
- Lawrence, A., 2013. Individual investors and financial disclosure. *J. Acc. Econ.* 56, 130–147.
- Leuz, C., Wysocki, P., 2016. Economic consequences of disclosure and financial reporting regulation: evidence and suggestions for future research. *J. Acc. Res.* 54 (2), 525–622.
- Levine, R., Renelt, D., 1992. A sensitivity analysis of cross-country growth regressions. *Am. Econ. Rev.* 82 (4), 942–963.
- Li, S., 2010. Does mandatory adoption of International Financial Reporting standards in the European Union reduce the cost of equity capital? *Acc. Rev.* 85 (2), 607–636.
- Lin, S., Riccardi, W., Wang, C., 2012. Does accounting quality change following a switch from U.S. GAAP to IFRS? evidence from Germany. *J. Acc. Public Policy* 31, 641–657.
- Loureiro, G., Taboada, A., 2015. Do improvements in the information environment enhance insiders' ability to learn from outsiders? *J. Acc. Res.* 53 (4), 863–905.
- Naranjo, P., Saavedra, D., Verdi, R., 2018. The Pecking Order and Financing Decisions: Evidence from Changes to Financial Reporting Regulation. Working Paper. Sloan School of Management, MIT.
- Ozkan, N., Singer, Z., You, H., 2012. Mandatory IFRS adoption and the contractual usefulness of accounting information in executive compensation. *J. Acc. Res.* 50 (4), 1077–1107.
- Pownall, G., Wiczynska, M., 2018. Deviations from mandatory adoption of IFRS in the European Union: implementation, enforcement, incentives and compliance. *Contemp. Acc. Res.* 35 (2), 1029–1066.
- Ramanna, K., Sletten, E., 2014. Network effects in countries' adoption of IFRS. *Acc. Rev.* 89 (4), 1517–1543.
- Scott, T., 1994. Incentives and disincentives for financial disclosure: voluntary disclosure of defined benefit pension plan information by Canadian companies. *Acc. Rev.* 36, 111–128.

- Shroff, N., Verdi, R., Yu, G., 2014. Information environment and the investment decisions of multinational corporations. *Acc. Rev.* 89, 759–790.
- Stigler, G., 1964. A theory of oligopoly. *J. Political Econ.* 72 (1), 44–61.
- Stiglitz, J., Weiss, A., 1981. Credit rationing in markets with imperfect information. *Am. Econ. Rev.* 71 (3), 393–410.
- Sutton, J., 1991. *Sunk Costs and Market Structure*. MIT Press, Cambridge, MA.
- Tirole, D.F.a.j., 1986. Capital as a commitment: strategic investment to deter mobility. *J. Econ. Theory* 31, 227–250.
- Tobin, J., 1969. A general equilibrium approach monetary theory. *J. Money Credit Banking* 1, 15–29.
- Verrecchia, R., 1983. Discretionary disclosure. *J. Acc. Econ.* 5, 365–380.
- Verrecchia, R., 2001. Essay on disclosure. *J. Acc. Econ.* 32 (1), 97–180.
- Welker, M., 1995. Disclosure policy, information asymmetry, and liquidity in equity markets. *Contemp. Acc. Res.* 11 (2), 801–827.
- Wernerfelt, B., 1984. A resource-based view of the firm. *Strateg. Manage. J.* 5 (2), 171–180.
- Wu, J., Zhang, I., 2014. The adoption of internationally recognized accounting standards: Implications for the credit markets. *J. Acc. Auditing Finance* 29 (2), 95–128.
- Yu, G., Wahid, A., 2014. Accounting standards and international portfolio holdings. *Acc. Rev.* 89 (5), 1895–1930.
- Zhang, G., 2013. Accounting standards, cost of capital, resource allocation, and welfare in a large economy. *Acc. Rev.* 88 (4), 1459–1488.