# Regulation of Disclosure and Corporate Governance:

# An Empirical Investigation of Economic Consequences

**Dissertation**

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# 1  Introduction

## 1.1  Motivation of the thesis

In the past few years, in particular following the financial crisis, the level of regulation of disclosure and corporate governance in Germany and the European Union has increased substantially. Since 2005, the so-called IAS regulation (Regulation (EC) No. 1606/2002) requires all firms listed in regulated EU stock market segments (with a few exceptions) to prepare consolidated accounts in accordance with IFRS. Also, the regulation mandates member states to set up institutions charged with the enforcement of accounting standards to ensure an even level of compliance with IFRS across member states. Apart from the introduction of mandatory IFRS reporting and enforcement, firms listed in the EU-regulated market have been subject to various other regulatory measures pertaining to firm disclosures such as the Transparency Directive (Directive 2004/109/EC), that mandated the publication of interim reports, and the Market Abuse Directive (Directive 2014/57/EU), that stipulates, among other things, the publication of directors' dealings. While the mandate to publish interim reports was revoked in 2013 (Directive 2013/50/EU), regulation of insider trading was increased and extended to stocks traded over-the-counter in 2014 (Regulation (EU) No. 596/2014). Other recent examples of the regulation of disclosures on the level of the European Union are the "CSR (Corporate Social Responsibility) Directive" (Directive 2014/95/EU), that mandates the disclosure of non-financial and diversity information, and the European Union audit reform, that, among other things, mandates audit firm rotation (Regulation (EU) No. 537/2014) and introduces restrictions on non-audit services (Directive 2014/56/EU).

Apart from the regulation of disclosure, firms listed in the regulated EU stock market in Germany have faced an increasing level of regulation of corporate governance, in particular in the field of executive compensation. In 2002, the German Corporate Governance Code (*'Deutscher Corporate Governance Kodex'*) was first introduced and laid down detailed soft law requirements on corporate governance for listed firms on a 'comply or explain' basis (sec. 161 Stock Corporation Act). The German Corporate Governance Code is revised regularly and, due to relatively low compliance rates (Von Werder and Talaulicar, 2009; Von Werder, 2011), various requirements have been converted to hard law. Examples for such conversions are the Act on Disclosure of Executive Board Remuneration (*'Vorstandsvergütungs-Offenlegungsgesetz'* (VorstOG)) from

2005, that mandates listed firms to disclose compensation for each board member, and the Appropriate Director Compensation Act (*'Vorstandsvergütung-Angemessenheitsgesetz'* (VorstAG)), a direct answer to the financial crisis (Deutscher Bundestag, 2009b), that regulates the structure of the remuneration of listed firms.

The economic literature proposes three key theories of economic regulation (Shleifer, 2005): 'public interest' theory, 'contracting' theory, and 'capture' theory. The 'public interest' theory of regulation proposes that the government is able to prevent market failure through regulation (Pigou, 1938). According to the 'contracting' theory, market failure is, in most cases, solved by competition and private contracting (Coase, 1960). If these mechanisms fail to prevent market failure, private contracting can be enforced by courts. Consequently, only little governmental intervention is required. The ensuing 'capture' theory proposes that regulation is often influenced by the interests of firms, and regulators are thus barely able to increase social welfare (Stigler, 1971). However, Shleifer (2005) proposes that regulation can be beneficial, for example if court proceedings are slow or inefficient thus limiting enforcement of private contracts by courts. Glaeser et al. (2001) argue that in the field of stock market regulation governmental regulation is preferable to enforcement by courts. Leuz (2010) summarizes four arguments in support of the regulation of financial reporting and disclosure. (1) Regulation can create positive externalities. (2) The standardization associated with the regulation of financial reporting and disclosure can produce market-wide cost savings. (3) While private contracting can only impose (potentially insufficient) monetary sanctions, regulators are able to introduce stricter sanctions through public enforcement and criminal penalties. (4) Regulation can mitigate costs from agency conflicts that affect the economy as a whole as controlling insiders choose private benefits over profitable investment opportunities by mandating increased disclosure. However, regulation of disclosure and financial reporting is limited since the optimal level of disclosure varies across firms and contexts. Thus, regulators are unable to mandate an optimal level of disclosure that is generally applicable (Leuz, 2010). Successful regulation demands for a careful consideration of the advantages and disadvantages of the regulation, which can be achieved through evidence-based regulation (Buijink, 2006; Gassen and Günther, 2014). Buijink defines evidence-based regulation as "regulation […] based on peer-refereed scientific evidence" (p. 298). While it is to date impossible to measure total net benefits of disclosure and reporting regulation, researchers can conduct studies that evaluate specific aspects of new regulation (Leuz and Wysocki, 2016). The identification and quantification

of regulatory effects is useful when assessing costs and benefits of disclosure and reporting regulation. While the analysis of the economic effects of regulation requires the assessment of the intended consequences, research also needs to investigate unintended consequences (Brüggemann et al., 2013; Gassen and Günther, 2014; Leuz and Wysocki, 2016).

## 1.2 Context and objective of the thesis

As established in the previous section, the level of regulation of disclosure and corporate governance on the national and supranational level has increased substantially in the last decade. With that in mind, and in the light of the demand for evidence-based financial reporting and disclosure regulation outlined in the previous section (Buijink, 2006; Gassen and Günther, 2014; Leuz and Wysocki, 2016), this dissertation aims at investigating economic consequences of such regulation. In particular, this dissertation attempts to provide empirical evidence that helps regulators to assess intended and unintended economic consequences of regulating disclosure and corporate governance.

My dissertation comprises three studies that relate to the economic evaluation of intended and unintended consequences of specific regulatory measures in the field of the regulation of disclosure and corporate governance. The *first study*, *"Market Reactions to the Regulation of Executive Compensation"*, investigates the market perception of the regulation of corporate governance in Germany under the VorstAG, an exogenous shock to contractual arrangements. The study aims to infer whether investors perceive the regulation of executive compensation contracts as value enhancing. The *second study*, *"Investor Perceptions of Opting Out of the EU-Regulated Market"*, exploits an exogenous shock to the costs for opting out of the EU-regulated market, and thus extensive regulation of disclosure and corporate governance. The study aims to investigate whether investors value the bonding to the extensive disclosure requirements in the EU-regulated market or whether investors welcome being able to opt out of the EU-regulated market due to an unfavorable cost-benefit tradeoff. The final and *third study* of this thesis, *"Why Do Firms Downlist? Evidence on the Costs of IFRS Compliance and Enforcement"*, examines determinants and consequences of firms' downlisting decision. The study aims to infer whether costs of disclosure, namely IFRS compliance and enforcement, drive firms away from the EU-regulated market. Figure 1.1 summarizes the objectives and structure of my thesis.

**Figure 1.1:** Objectives of the thesis
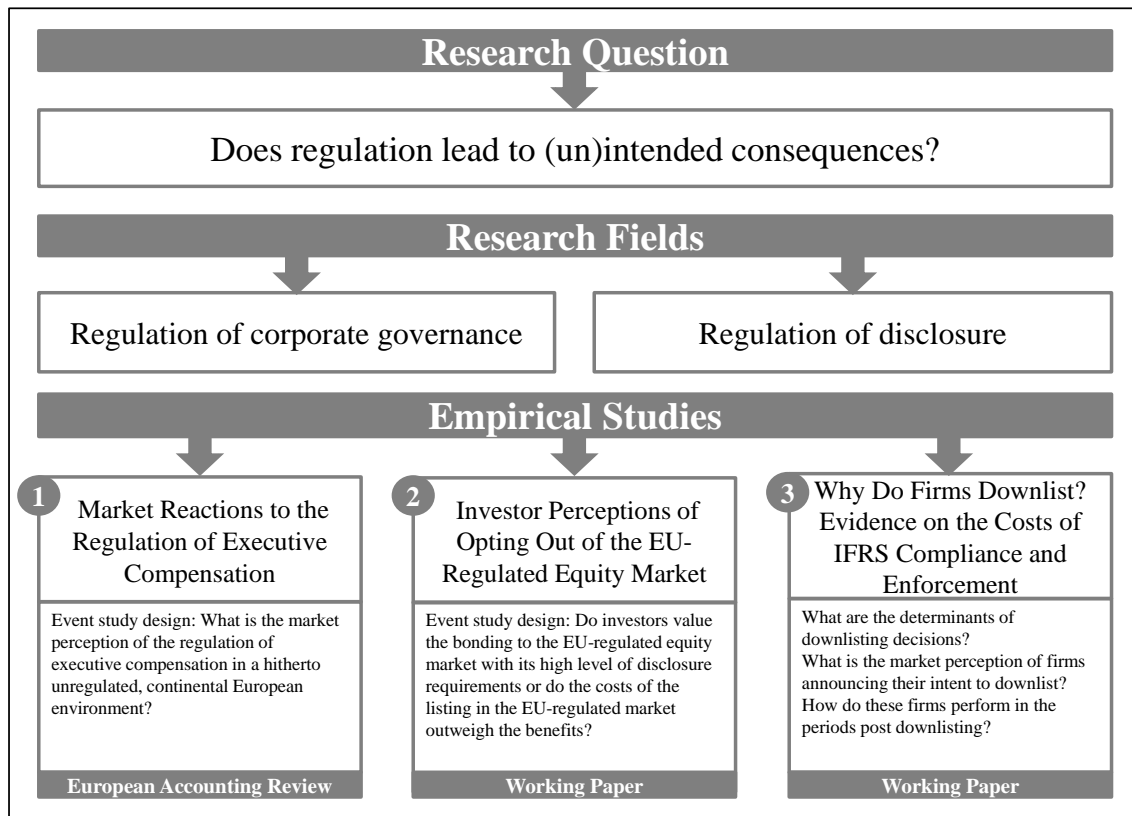


*Study 1: Market Reactions to the Regulation of Executive Compensation (Chapter 2)*

Regulatory interference with private contracting potentially creates value if contractual arrangements absent regulation are inefficient. The wide body of literature on the efficiency of executive compensation contracts proposes two non-exclusive explanations, namely the efficient contracting approach and the managerial power or rent extraction view (e.g., Betrand, 2009; Frydman and Jenter, 2010). Under the efficient contracting approach, existing contractual arrangements are regarded as an efficient solution to mitigate agency problems that result as shareholders entrust managers with managing their firms (Jensen and Meckling, 1976). In contrast, the managerial power or rent extraction view proposes that observable contracts do not represent efficient contractual outcomes, but serve as vehicles for powerful managers to extract inappropriate compensation (Bebchuk and Fried, 2003). Compensation contracts are both a part and a product of firm-level corporate governance choices. Given the firm-level endogeneity of governance choices, the degree of cross-sectional efficiency of compensation contracts is not observable. Exogenous shocks to the governance system, which shake up existing contractual arrangements, therefore potentially yield revealing insights (Frydman and Jenter, 2010; Larcker et al., 2011). The *first study* exploits such a shock, the regulation

of executive pay and supervisory board liability in Germany, to glean insights into the market perception of the economic effects of the regulation in a continental European setting. The underlying premise is that any regulation receives vindication only if it can be expected to increase welfare.

*Study 2: Investor Perceptions of Opting Out of the EU-Regulated Equity Market (Chapter 3)*

A firm's commitment to strict reporting and disclosure requirements reduces information asymmetry, increases liquidity, and lowers costs of capital (e.g., Botosan, 1997; Leuz and Verrecchia, 2000). Bonding theory suggests that monitoring imposed on firms by committing to a stricter listing regime that is hard to dispense with increases firm value (Coffee, 1999; Stulz, 1999; Coffee, 2002). By voluntarily subjecting themselves to higher disclosure requirements and higher levels of enforcement, issuers reduce information asymmetries between managers, or majority shareholders, and minority shareholders. Consequently, committing to a stricter listing regime increases minority investor protection. As this commitment is costly, it may function as a signal of positive future prospects of a firm (e.g., Mittoo, 1992). A firm's listing choice is driven by evaluating costs (e.g., direct costs of the listing, indirect costs that result from mandatory reporting requirements, and voluntary disclosure expected by investors) and benefits (e.g., capital raising opportunities, lower information asymmetry, and hence higher liquidity) of the listing status (Bharath and Dittmar, 2010; Chaplinsky and Ramchand, 2012). Since firms continuously evaluate the costs and benefits of their listing status, a shift in the related costs or benefits can lead to a revision in a firm's listing choice. The loss of competitiveness theory suggests that a firm's decision to discontinue its listing in a stricter listing regime is likely driven by an increase in compliance costs that leads to an unfavorable cost-benefit tradeoff (Zingales, 2007). However, if a firm faces an unfavorable cost-benefit tradeoff, but costs associated with opting out of the listing regime are prohibitively high, the firm may choose to remain within the current listing regime. Thus, a reduction in the requirements for opting out of the listing regime may lead to a revision in the firm's listing choice. The *second study* examines equity market reactions to recent changes in requirements for opting out of the EU-regulated market to investigate whether investors value the bonding to the high level of disclosure in the EU-regulated market or whether they welcome being able to leave the costly EU-regulated market, as proposed under the loss of competitiveness theory.

*Study 3: Why Do Firms Downlist? Evidence on the Costs of IFRS Compliance and Enforcement (Chapter 4)*

When Regulation (EC) No. 1606/2002 was introduced, regulators stated that mandatory IFRS reporting was to "contribute to the efficient and cost-effective functioning of the capital market" (Regulation (EC) No. 1606/2002, p. L243/1) and that "a proper and rigorous enforcement regime [was] key to underpinning investors' confidence in financial markets" (Regulation (EC) No. 1606/2002, L243/2). Indeed, numerous academic studies have documented various positive effects of the adoption of mandatory IFRS reporting, in particular significant positive capital market effects such as increases in liquidity (e.g., Brüggemann et al. 2013). Also, recent evidence by Christensen et al. (2013) finds that the mandated strengthening of enforcement quality likely played an important role in generating or facilitating the observed positive liquidity effects upon IFRS adoption in the EU. For Germany, Hitz et al. (2012) document significant market value discounts upon the disclosure of accounting errors by the two-tier enforcement mechanism that increase with the severity of error findings. Ernstberger et al. (2012) provide evidence that earnings management decreases and stock liquidity and market valuation increase for firms that are subject to the new enforcement regime and concurrently installed audit oversight procedures. In contrast to this abundant evidence of positive economic effects that are in line with regulators' aims, far less is known about the costs of the IFRS regulation on the firm-level and for economies as a whole. One likely reason for this lack of pertinent research is the scarcity of information and data on costs of IFRS compliance and enforcement. The *third study* aims to fill this gap by investigating determinants and consequences of firms' decisions to leave the EU-regulated market, and thus mandatory IFRS reporting and the enforcement mechanism, in Germany.

## 1.3  Content of the thesis

This thesis proceeds as follows. The thesis comprises three studies on the economic consequences of the regulation of disclosure and corporate governance. The *first study* of this thesis investigates equity market reactions to the regulation of executive compensation (Chapter 2). The *second study* of this thesis examines investor perceptions of opting out of disclosure requirements of the EU-regulated market (Chapter 3). The *third and final study* of this thesis investigates determinants and consequences of firms' downlisting choices (Chapter 4). The final Chapter 5 concludes.

*Study 1: Market Reactions to the Regulation of Executive Compensation (Chapter 2)*

The *first study* investigates equity market reactions to the regulation of executive compensation by exploiting a quasi-natural experimental setting in Germany, the introduction of the VorstAG in 2009. Adoption of the VorstAG represented an exogenous shock to the contracting environment and therefore creates a quasi-natural experimental setting to investigate the economic effects of a regulatory intervention with compensation arrangements. The VorstAG introduced restrictions on the amount and on the components of board executive compensation packages, and invoked liability for the supervisory board in case of inappropriate remuneration arrangements. Thus, the regulation stipulated an unprecedented interference with private compensation schemes. The study uses this exogenous shock to the contracting environment to infer market perceptions of the usefulness of the regulation. Using event study methodology, the study investigates market reactions for the first-time announcement of regulatory intent and for a pooled sample of seven events leading to the adoption of the VorstAG.

The study provides evidence that investors do not perceive the regulation of executive compensation value enhancing. Rather, the study provides weak evidence of an average negative market reaction to the proposed regulation. Multivariate analyses reveal that firms which were particularly affected by the regulation because board members received high abnormal remuneration experienced larger stock price discounts on average. Consistent with this, the study provides evidence of a positive relation between pay-performance sensitivity and the equity market reaction. Thus, the market reaction was more negative when a firm was more affected by the regulation due to a weak link of pay to performance. Taken together, these findings indicate that the regulation was not considered beneficial from a shareholder perspective. This result is consistent with the market perceiving the regulation of executive compensation to impose potentially inefficient contractual arrangements for some firms.

*Study 2: Investor Perceptions of Opting Out of the EU-Regulated Equity Market (Chapter 3)*

The *second study* investigates equity market reactions to changes in requirements for opting out of the EU-regulated market to examine whether the bonding to the EU-regulated market is valued by investors or whether the costs of the listing under the stricter listing regime outweigh the benefits, as proposed by the loss of competitiveness theory. Following several regional court rulings, in 2012 and 2013, requirements for

opting out of the EU-regulated market were gradually reduced in Germany, effectively allowing opting out of the EU-regulated market without (minority) shareholders' consent. In 2015, stricter regulation was implemented, requiring firms to offer compensation to (minority) shareholders. This setting allows me to investigate the effect of being able to opt out of the EU-regulated market with its high disclosure requirements on shareholder welfare. Using event study methodology, the study measures market reactions and determinants of market reactions around four (six) events that reduce (increase) the requirements for opting out of the EU-regulated market in Germany. Market reactions are expected to be more pronounced for firms that are more likely to consider opting out of the EU-regulated market due to high compliance costs, low financing needs, low liquidity, more concentrated ownership, and low commitment to disclosure, as measured by non-compliance with reporting requirements and non-commitment to voluntary disclosure.

Findings from the second study are mainly indicative of cost considerations, as proposed under the loss of competitiveness theory, which are shared by investors. While reductions in opt out requirements seem to have an impact on investors, as reflected in abnormally high trading volume, increases in the requirements for opting out do not. Correspondingly, findings on price reactions mostly relate to events leading to reduced opt out requirements. Findings on the determinants of price reactions suggest that for firms with high ownership concentration, and firms previously censured under the German enforcement regime, the costs of the listing seem to outweigh the benefits of the listing and being able to opt out might enhance shareholder welfare. Also in line with the loss of competitiveness theory, investors of financially distressed, leveraged firms seem to welcome the reduced requirements for leaving the costly EU-regulated market. However, findings on leveraged firms can also be reconciled with the bonding hypothesis. Monitoring by banks can be interpreted as an alternative monitoring mechanism that makes bonding to the EU-regulated market redundant. Firms that opt out subsequently under the reduced regulation exhibit significantly negative price reactions to reductions in opt out requirements. This price reaction is likely attributable to the fact that investors had anticipated compensation. In many cases, investors already knew that the firm was intending to downlist. If investors had anticipated compensation in exchange for their shares, that was no longer required under the revised regulation, these investors would have incurred welfare decreases.

*Study 3: Why Do Firms Downlist? Evidence on the Costs of IFRS Compliance and Enforcement (Chapter 4)*

The *third study* investigates the role of costs associated with mandatory IFRS adoption and pertinent enforcement activities based on a sample of all firms that announced their intent to downlist, that is, to migrate from the EU-regulated market to a private, exchange-regulated market (over-the-counter market), during the 2009-2014 period. Since 2009, authoritative court rulings in Germany have substantially lowered the legal threshold for firms to downlist. While downlisting requirements were almost prohibitively restrictive prior to 2009, the revised legal interpretation substantially lowered the bar for firms to leave the regulated market, and therefore, in essence, to opt out of the IFRS mandate and enforcement supervision. The study exploits the exogenous shock to the cost-benefit tradeoffs associated with opting out of the EU-regulated market in Germany, that is also investigated in the second study, and examines firms that leave the EU-regulated market under the reduced opt out requirements. In particular, it exploits two specific features of the German setting, the availability of error findings established by the enforcement mechanism and the observability of market and accounting data after firms have downlisted, to identify drivers of firms' decisions to opt out of the IFRS and enforcement mandate. The study sheds light on the cost-benefit tradeoffs associated with mandatory IFRS application and enforcement scrutiny using a determinants model and two sets of supplementary analyses (i.e., market reactions to downlisting announcements and the post-downlisting performance of downlisting firms relative to a sample of propensity score matched firms).

Findings from the third study provide evidence on costs of regulation, namely the previous introduction of the IFRS mandate and the concurrent enforcement mechanism in the European Union. Evidence is consistent with IFRS compliance and enforcement related costs representing significant determinants of firms' decisions to opt out of the regulated market. The likelihood for firms to opt out of the IFRS and enforcement mandate is negatively associated with firm size and profitability, and increases for firms that were censured by the enforcement mechanism, in particular for firms with severe accounting errors. In contrast, opt out likelihood is reduced as transparency benefits increase (liquidity, voluntary IFRS adoption). These findings suggest that despite the benefits that prior literature has documented, the pertinent costs of the IFRS mandate may be restrictively high for a substantial number of firms. The results from the first supplementary analysis document large variation in market price reactions, which limits

inferences. Findings from the second supplementary analysis demonstrate that more than half of the firms that downlisted before 2013 opted to continue reporting under IFRS on a voluntary basis. Compared to a sample of matched firms that retained their listing in the regulated market, downlisting firms experienced slight decreases in size, liquidity, and in audit fees after migrating to the stock-exchange administered market.

## 2    Market Reactions to the Regulation of Executive Compensation

Jörg-Markus Hitz and Stephanie Müller-Bloch[1,2]

**Abstract:** This paper investigates equity market reactions to the regulation of executive compensation. We exploit a natural experimental setting in Germany, where recent legislation introduces restrictions on the amount and on the components of board executive compensation packages, and invokes liability for the supervisory board in case of inappropriate remuneration arrangements. We use this exogenous shock to the contracting environment to infer market perceptions of the usefulness of the regulation. Using event study methodology, we investigate market reactions for the first-time announcement of regulatory intent and for a pooled sample of seven events leading to the adoption of the law act. We find weak evidence of an average negative market reaction to the proposed regulation. Multivariate analyses reveal that firms which were particularly affected by the regulation because board members received high abnormal remuneration experienced larger stock price discounts on average. Consistent with this, we find a positive relation between pay-performance sensitivity and the equity market reaction. Taken together, these findings indicate that the regulation was not considered beneficial from a shareholder perspective. This result is consistent with the market perceiving the regulation of executive compensation to impose potentially inefficient contractual arrangements for some firms.

*JEL Classification:* M 12, M 48, M 52.

*Keywords:* Executive compensation, regulation, corporate governance.

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## 2.1 Introduction

This paper investigates market reactions to the regulation of executive compensation in Germany. In an immediate reaction to the financial crisis and the perceived catalysing role of compensation contracts geared towards short-term performance, the German legislator in June 2009 adopted the *Vorstandsvergütung-Angemessenheitsgesetz* (VorstAG). This 'Appropriate Director Compensation Act' stipulates an unprecedented interference with private compensation schemes. While extant company law broadly required the supervisory board to set an 'appropriate' remuneration for members of the executive board, the VorstAG mandates that compensation (1) be 'customary', (2) reflect management performance (pay for performance), and (3) be tied to metrics of long-term performance. In addition, the VorstAG includes an array of specific provisions on executive compensation, and the non-binding advisory vote of shareholders on board compensation ('say on pay'). Also, it invokes liability for supervisory board members should they set inappropriate compensation. Taken together, this legal initiative substantially altered the regulatory environment in Germany and impacted heavily on the shape of compensation contracts (Götz & Friese, 2012).

Adoption of the VorstAG represented an exogenous shock to the contracting environment and therefore creates a natural experimental setting that allows us to shed light on the economic effects of a regulatory intervention with compensation arrangements. An exhaustive branch of literature addresses how compensation contracts evolve, providing two competing explanations. The 'efficient contracting' hypothesis asserts that observable contracts, on average, are effective in setting incentives for managers to act in the interest of capital providers (e.g. Bertrand, 2009). In contrast, authors such as Bebchuk and Fried (2003) conjecture that managers have incentives to install mechanisms of 'entrenchment' to avoid control by their principals, and to negotiate inefficient contracts that benefit managers at the expense of shareholders ('pay without performance'). While the efficiency or inefficiency of compensation contracts in place is not observable, our objective is to infer to what extent market participants regarded the recent regulation as beneficial, by forcing more firms towards efficient contracts that resolve shareholder-manager conflicts.

We identify seven events on the way to the adoption of the VorstAG. These events presumably significantly altered market expectations with respect to the likelihood or the scope and content of the regulation of executive compensation. For a sample of firms

listed on the German stock market, we investigate the perceived economic effects of the regulation by observing market-adjusted returns (MARs) around these event dates. We find that over all seven events, the average MAR was negative for our sample, indicating that all in all, the equity market reacted negatively to the regulation. In a second set of analyses, we shed more light on market perceptions by regressing MARs on firm-level characteristics that indicate which firms were likely to be particularly affected by the regulation. We hypothesize that firms with high abnormal, that is, above industry average, compensation arrangements specifically fall under the provision of the VorstAG to award no more than 'customary' remuneration. While abnormal compensation represents our main test variable, we also use pay-performance sensitivity as a (presumably weaker) measure of regulatory impact, since the VorstAG stipulates that remuneration be reflective of management's performance, a requirement that would particularly affect firms with no or only little performance-based compensation in place.

To lend robustness to our findings and to ensure proper identification of effects induced by the pending regulation, we perform two sets of multivariate analyses. First, we estimate our regressions for the first-time announcement of the then ruling coalition to regulate executive compensation, as this event represents the exogenous shock which significantly increased the likelihood of regulatory interference with the amount and structure of compensation contracts. Our second set of regressions is estimated for a pooled sample of all seven events, from the first-time announcement to the final adoption of the VorstAG by the German Parliament. This pooled analysis represents our main analysis, as it allows for stronger statistical inferences.

For our main test variable, abnormal pay, we document a significantly negative association with MARs. Consistent with this, we find a significantly positive relation between pay-performance sensitivity and MARs. These results hold both for the single-event analysis and for the pooled sample regressions, and are significant using (1) conventional test statistics and (2) test statistics obtained from non-event distributions of variables. These findings suggest that market participants regarded the regulation as value-decreasing in particular for firms with highly paid executives and firms with low-powered incentives. Such a result is consistent with shareholders expecting the VorstAG to impair efficient contracting for these firms.

Our findings are in line with Larcker, Ormazabal, and Taylor (2011), who investigate regulation of executive compensation in the USA, and document negative market reac-

tions for firms with excess CEO compensation. However, our paper augments this prior evidence and makes several incremental contributions. First, our results are more robust, as we are able to triangulate our findings using single-event and pooled event analyses. Second, exploiting a rich hand-collected dataset, we are able to demonstrate that our findings translate to an alternative contractual measure, pay-performance sensitivity. Third, by using a finer partitioning of our abnormal or excess compensation measure, we are able to demonstrate that negative market value reactions occur for presumably 'overpaid' managers only, but not for managers with below-average compensation.

Finally, and most importantly, we demonstrate that the Larcker et al. (2011) results translate to an institutional environment with particularly different features. In the German two-tier system, an independent supervisory board sets management compensation, with the objective of enacting not only shareholders' interests, but also to recognize other stakeholders such as creditors or employees (e.g. Haar, 2012). Supervisory boards are required to enact such a stakeholder model, and to ensure the long-term existence of the firm. Larcker and Tayan (2011, p. 44) therefore conjecture that regular shareholders have less influence on board matters in Germany as, for example, in the USA. If accordingly, existing contracts in the German setting are on average less efficient from a shareholder perspective, then the VorstAG might very well have a beneficial effect. Put differently, it is an open empirical question whether existing contracts represent efficient outcomes from a shareholder perspective, and to what extent recent regulation has an impact on shareholder wealth. Despite these differences in the German governance model, our analyses do not indicate beneficial effects of regulating executive compensation from an equity market perspective. This suggests that at least from a shareholder perspective, there is no evidence in support of executive compensation regulation, be it in a shareholder-based economy or a stakeholder-oriented system.

Taken together, our findings are in line with concerns regarding the usefulness of interfering with private contracting in the sphere of management compensation. It is up to future research to demonstrate whether there are areas of corporate governance where regulatory interference with private contracting potentially generates welfare. Therefore, the results of our paper should be of interest to national and supranational regulators, in particular the European Union, and to researchers in the field of executive compensation and corporate governance.

The remainder of this paper is organized as follows. Section 2.2 elaborates on the regulatory background. Section 2.3 discusses prior literature and develops our hypotheses. In Section 2.4 the methodology is outlined. Section 2.5 presents and discusses the empirical findings. Our final Section 2.6 concludes.

## 2.2 Background: Regulation of executive compensation in Germany

In the wake of corporate scandals and increased awareness of the role and importance of governance mechanisms, various aspects of corporate governance, including disclosure and setting of board compensation, have been subject to hard-law regulation in Germany during recent years. The Act on Disclosure of Executive Board Remuneration (*Vorstandsvergütungs-Offenlegungsgesetz* (VorstOG)) since 2006 mandates listed firms to disclose for each board member the total compensation, broken down into fixed salary, short-term bonus, and long-term incentives. The Appropriate Director Compensation Act (VorstAG), effective since August 2009, directly affects how executive compensation is set. As our paper investigates market reactions to critical events leading to the adoption of the VorstAG, the remainder of the section details the state of compensation regulation prior to the VorstAG, and the changes introduced with this new legislation.

Under the German two-tier system, the executive board of a public company is charged with developing and implementing the firm's strategy and managing day-to-day business. Members of the executive board are appointed by the supervisory board. The supervisory board oversees and controls the executive board (Hopt, 2011; Larcker & Tayan, 2011, pp. 44-46). One of the more specific tasks of the supervisory board is to negotiate compensation contracts with members of the executive board. Prior to the VorstAG, par. 87 of the securities act merely required the supervisory board to set 'appropriate' compensation. As 'appropriateness' was never detailed by the lawmakers or the courts, this requirement effectively had no restraining influence on the setting of compensation contracts, which essentially followed a business judgement rule (Haar, 2012). Complementary to this virtually ineffective hard law provision, the German Corporate Governance Code since 2002 laid down detailed soft law requirements, requiring, for example, compensation packages to include an appropriate portion of both fixed and performance-based components, and a cap to preclude excessive payments in cases of high firm performance (par. 4.2.3). However, in practice, a substantial portion of firms chose not to comply with these principles (von Werder & Talaulicar, 2009), and even when they stated they did, practices varied substantially, given the rather general

tone of the Code's requirements (von Werder, 2011). Taken together, the overall level of regulation pertaining to executive board compensation was therefore relatively low prior to 2009.

The VorstAG was adopted in 2009 as a response to the 2008 financial crisis, and to the public and political perception that compensation contracts geared towards short-term performance targets had played a role in the practice of excessive risk taking (Deutscher Bundestag, 2009b). The VorstAG amended and enlarged existing company law. Most importantly, the requirement for the supervisory board to set 'appropriate' compensation was detailed along three dimensions. Under the revised legislation, appropriate compensation contracts (1) should not exceed 'customary' remuneration, (2) should be 'performance-based', and (3) should be geared towards 'sustainable firm development'.[4]

The legislator's basis for conclusions to the law act and pertinent clarifications from law scholars shed light on the meaning of these three criteria. Accordingly, a 'customary' compensation is one that is of a comparable nature with respect to managers who hold similar positions with other firms. Comparability may also relate to the ratio of board compensation to regular employees' compensation. However, currently, there is no consensus on how high such a ratio should be. Therefore, comparability refers in particular to peer firms' average executive compensation, which means that industry standards play an important role in setting executive compensation. The second criterion requires a substantial fraction of the compensation to be tied to managerial performance. While this requirement for executive compensation to be 'performance-based' can be expected to generally increase the proportion of variable remuneration components, the third criterion emphasizes in particular the use of long-term performance targets to that end (Deutscher Bundestag, 2009b).

Any performance-linked compensation is additionally subjected to the requirement for the supervisory board to include caps that prevent excessive payments in case of an 'extraordinary development'. The legislator emphasizes the intent to substantially alter compensation practices by also introducing a liability clause for members of the supervisory board for setting 'inappropriate compensation'. Also, the supervisory board is

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[4]    While provisions (1) and (2) apply to all incorporated firms, (3) is restricted to listed corporations.

now explicitly required to reduce compensation, that is, to interfere with existing contracts, in cases of financial / economic distress.

The VorstAG also introduced a set of specific provisions and rules. For one thing, the new legislation prescribes minimum personal liability of executive board members under D&O insurance of up to one and a half times the fixed portion of annual salary. Also, the minimum vesting time for stock options granted is increased from two years to four years. Second, in contrast to the extant practice of deferring issues of executive pay to a compensation sub-committee of the supervisory board, contracts now must be approved by the whole supervisory board, which under the German system of co-determination also includes employee and trade union representatives. Finally, the VorstAG adopts an optional advisory vote on the 'compensation system' for the annual shareholders' meeting of listed corporations, the so-called say on pay.

Taken together, the VorstAG introduces criteria and restrictions for executive compensation that were absent in the German system prior to the regulation, accompanied by increasing liability for supervisory board members to set legally correct contracts. The regulation and its pertinent documentation reflect the legislator's determination to substantially alter compensation practices. This expectation is confirmed by early evidence on the implications of the VorstAG.[5] Götz and Friese (2010, 2011, 2012) document the staggered implementation of the new rules, which are binding only for contracts set after August 2009. Surveying a sample of the 80 firms listed in the blue chip indices DAX and MDAX, the authors find that by 2011, 56 firms had geared their performance-related compensation components towards long-term determinants, 42 firms had increased the proportion of long-term performance-related components in relation to short-term components, and 29 firms had introduced a cap. Share-based payment was modified in 22 firms, and 16 firms had introduced a compensation system that allows for both bonuses and reductions in compensation.

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[5]    Firms disclose in their annual reports how they implemented the VorstAG. For example, in the 2009 annual report of Volkswagen, a German car manufacturer, it is outlined that 'the remuneration structure is focused on ensuring sustainable business growth in accordance with the [VorstAG]' (Volkswagen, 2010, p. 112). In addition to fixed compensation and a business performance-based bonus, Volkswagen implemented the VorstAG by adopting a new long-term incentive programme starting in 2010, the so-called Strategy 2018. Under this programme, long-term performance-related compensation of executive board members is based on the four-year average of four criteria, a customer satisfaction index, an employee index (including employment rate, productivity, and employee satisfaction), sales growth, and increases in return on sales (Volkswagen, 2010, p. 113).

## 2.3 Hypotheses development

The objective of this paper is to exploit the quasi-experimental VorstAG setting to investigate whether this regulation of executive compensation created value for shareholders. The equity value impact is measured by stock market reactions to the (expected) regulation. On a semi-strong form efficient market, investors instantaneously and correctly factor such publicly available information into prices. Therefore, stock prices reflect the market's joint perception of the likelihood of the regulation and of its economic effects. An increased likelihood of regulation c.p. accentuates impacts on firm value (Schwert, 1981).

Regulatory interference with private contracting potentially creates value if contractual outcomes in equilibrium are inefficient. Therefore, the equity market value effect of the regulation is related to the unobservable efficiency of board compensation contracts. A rich literature examines determinants of executive compensation in the context of efficient contracting. Broadly, this literature proposes two non-exclusive explanations for various aspects of compensation contract design, and provides evidence for both (see reviews, e.g. Bertrand, 2009; Frydman & Jenter, 2010). Under the efficient contracting approach, existing contractual arrangements are regarded as an efficient solution to mitigating agency problems that result as shareholders entrust managers with managing their firms. Observable contractual features such as bonuses tied to firm performance, or stock option plans, and the time-series and cross-sectional variation therein, can be reconciled with the notion of principal agent theory that compensation contracts should align managers' interests with the owner objective of shareholder value maximisation (Jensen & Meckling, 1976). In contrast, the managerial power or rent extraction view proposes that observable contracts do not represent efficient contractual outcomes, but serve as vehicles for powerful managers to extract inappropriate compensation. Under this view, 'executive compensation is viewed not only as a potential instrument for addressing the agency problem but also as a part of the agency problem itself' (Bebchuk & Fried, 2003, p. 72). The key assumption here is that executives are not efficiently governed, for example, due to busy or captured boards of directors. Such inefficient control mechanisms enable managers to extract rents via means such as excessive perquisites, option backdating, strategic use of compensation consultants, or ineffective stock option grants not sufficiently tied to managerial performance.

Compensation contracts are both a part and a product of firm-level corporate governance choices. In equilibrium, compensation contracts, to varying degrees, can be reconciled with both the efficient contracting and the managerial power hypothesis. However, given the firm-level endogeneity of governance choices, the degree of cross-sectional efficiency of compensation contracts is not observable. Exogenous shocks to the governance system, which shake up existing contractual arrangements, therefore potentially yield revealing insights (Larcker et al., 2011; Frydman & Jenter, 2010). We exploit such a shock, the regulation of executive pay and supervisory board liability in Germany, to glean insights into the market perception of the economic effects of the regulation. The underlying premise is that any regulation receives vindication only if it can be expected to increase welfare. In line with a positive case for regulation from a shareholder perspective, we state our first hypothesis:

*H1:    On average, firm value increases with the increased likelihood or scope / content of regulation of executive compensation.*

Given the hitherto virtually unregulated nature of compensation arrangements in Germany, existing contracts show substantial heterogeneity. Accordingly, we expect firms to be affected by the regulation to different degrees, which should be mirrored by market value reactions. Therefore, in a second step, we investigate the relation between observable contractual features and market value reactions. Our main test variable here is abnormal or 'excess' compensation. As noted in Section 2.2, the provisions of the VorstAG mandate total compensation not to exceed the 'customary' level, that is, the industry average. Therefore, firms with above-industry average compensation levels are particularly affected by the regulation. If such regulatory interference is greeted by shareholders, we predict:

*H2:    Market value reactions to the increased likelihood or scope / content of regulation of executive compensation are positively associated with the degree of abnormal compensation.*

In addition to putting a ceiling on the total amount of compensation, the VorstAG also mandates compensation to be tied to (long-term) performance. Therefore, we expect firms to be particularly affected when they make little use of performance-based pay, that is, they have contracts in place with low pay-performance sensitivity. Accordingly, we state:

*H3:     Market value reactions to the increased likelihood or scope / content of regulation of executive compensation are negatively associated with the degree of pay-performance sensitivity.*

However, as the VorstAG is far less prescriptive with respect to the expected extent or fraction of performance-based compensation, we perceive pay-performance sensitivity as a weaker measure of how firms were affected by the VorstAG, compared to our main test variable, abnormal compensation.

While the concept of investigating market reactions to measure economic impacts of regulation is well established, starting with Schwert (1981), this paper is most closely related to the study by Larcker et al. (2011). These authors, among other things, investigate for a US setting market reactions to eight events which increased the likelihood of regulation of executive compensation that would limit compensation or introduce shareholders' non-binding vote on compensation ('say on pay'). While Larcker et al. (2011) obtain no meaningful results for the respective event dates, pooled analyses over all these eight events yield a negative significant association between excess CEO pay and abnormal event-day returns. The authors interpret this finding in the light of the efficient contracting hypothesis as an indication of a negative regulatory impact. As noted in the introduction, our paper differs to Larcker et al. (2011) along several dimensions. First, with respect to the analyses, we exploit a hand-collected dataset to investigate a second observable compensation feature, the sensitivity of board members' pay to performance. Second, and more importantly, we investigate a setting which differs markedly from the USA in terms of governance regulation and governance practices. In particular, in the German system, governance mechanisms need to reconcile the different objectives of various stakeholders, such as shareholders, creditors, and employees. This is reflected in the stated objective of governance regulation to ensure the long-term existence of the firm, and bears down, for example, on the composition of the supervisory board, where the so-called co-determination legally ensures representation of employees and their representatives (e.g. trade unions) (Haar, 2012). The efficiency of existing compensation contracts from a shareholder perspective is therefore an open empirical question, and so is the impact of the regulation of executive compensation on equity market values.

**2.4 Methodology**

*2.4.1 Measurement of market reactions to the (proposed) regulation*

To address our hypotheses, we measure MARs around seven events that significantly altered the probability or the scope and content of the regulation. In line with related prior literature (Armstrong, Barth, Jagolinzer, & Riedl, 2010; Cai & Walkling, 2011; Joos & Leung, 2013), we choose a three-day window around the respective events. Market reactions are measured using MARs, which we calculate as the difference between three-day raw returns for the respective firm, and three-day market returns. As our benchmark market index, we choose the FTSE World Europe excluding Germany, to exclude firms that are affected by the regulation, and therefore avoid underestimating the effect of the regulation (Zhang, 2007).

To address our first hypothesis, we measure the mean market reactions for each of our seven event dates leading to the adoption of the VorstAG (see Section 2.4.4) and for a pooled sample of these events. We apply three different test statistics to assess the significance of market reactions (Armstrong et al., 2010). First, using traditional test statistics, we test whether MARs around the events are significantly different from zero. However, the underlying assumption of traditional test statistics is that absent regulatory action MARs on average are zero. Thus, if MARs are not zero absent regulatory measures, documented market reactions could result from misspecification of test statistics. To address this concern, results in the absence of regulatory action are simulated using Monte-Carlo simulation. The two additional test statistics from the Monte-Carlo simulation employ mean MARs from 53 non-overlapping three-day non-event windows during the period from our first to our last event. We randomly select seven non-overlapping three-day non-event windows and calculate the mean MAR over these non-events. We follow, for example, Armstrong et al. (2010) and Zhang (2007), and repeat this procedure 1000 times to simulate the distribution of mean MARs over randomly selected non-event windows. For the second test statistic, we test whether the mean MARs over the pooled events are significantly different from the distribution of the simulated mean MARs. For the third test statistic, we calculate the weighted bootstrap p-value, which is the percentage of simulated mean MARs over seven non-events that are higher (in case of overall positive mean MARs) or lower (in case of overall negative mean MARs) than the pooled mean MARs for our events.

*2.4.2 Determinants model*

To test our hypotheses 2 and 3, we estimate the following model using ordinary least squares regressions:

$$MAR_{it} = \beta_0 + \beta_1 \text{ ABNORMAL PAY}_{it} + \beta_2 \text{ PAY SENSITIVITY}_{it} + \sum\gamma \text{ CONTROLS}_{it} + \mu \qquad (1)$$

where MAR is the market-adjusted return, calculated as described in Section 2.4.1. Our two test variables that capture the likelihood or extent to which firms were potentially affected by the regulation are our main variable of interest, the level of excess or abnormal pay (ABNORMAL PAY), and the sensitivity of executive compensation to firm performance (PAY SENSITIVITY). Under H2 (H3), we expect a positive (negative) and significant coefficient for ABNORMAL PAY (PAY SENSITIVITY).

We estimate three versions of our regression model. First, we estimate the complete model (1) for our full sample. To capture a potentially different impact of perceived 'overpayment' and 'underpayment', we estimate model (2), where we replace our main test variable ABNORMAL PAY with two binary variables for the top and the bottom quintile of ABNORMAL PAY (HIGH ABNORMAL PAY and LOW ABNORMAL PAY). Finally, as banks have been one stated main target of the regulation, and in light of the prominent role that high-powered incentives play in compensation arrangements at financial institutions, we use a third model specification, where we estimate the original regression model (1) for a subsample of firms that excludes banks and financial institutions (model (3)). For the first-time announcement of regulatory intent, we also re-estimate model (1) using one-day MARs to rule out that MARs around the first-time announcement were confounded by events related to the financial crisis.

Our vector of control variables includes a measure of ownership concentration (FREE FLOAT). A large literature documents that effective ownership control, in particular concentrated ownership, is positively related to the efficiency of compensation arrangements in place (e.g. Elston & Goldberg, 2003; Fahlenbrach, 2009; Harvey & Shrieves, 2001). According to Shleifer and Vishny (1997, p. 754), large shareholders have incentives to monitor the management and sufficient control rights to put pressure on the management. Consistent with this, Mehran (1995) finds that ownership concentration by outside investors might be a substitute for incentive pay. Also, we control for factors that prior literature has demonstrated to explain MARs or abnormal returns, namely the natural logarithm of market capitalisation (SIZE), and the market-to-book

ratio (MTB). Consistent with Larcker et al. (2011) and Ferri and Maber (2013), we also include the MAR over the prior six months (MOMENTUM). Furthermore, we use a binary variable that captures whether the respective firm participates in the DAX, the German blue chip index (DAX). DAX indicates the effect of the regulation for large firms with high visibility, which are likely to face particular public scrutiny and political pressure, which potentially accentuates market outcomes. Finally, we include industry controls (e.g. Cai & Walkling, 2011; Zhang, 2007).

We follow established methodology for analysing market reactions to regulation and estimate our determinants model both for our key event, the first-time announcement of the regulation (e.g. Cai & Walkling, 2011), and for a pooled sample encompassing all seven events that presumably altered the likelihood or scope and content of the regulation (e.g. Armstrong et al., 2010; Joos & Leung, 2013; Larcker et al., 2011).[6] This pooled analysis enables us to capture effects that, although small on the individual event level, occur on multiple events (Larcker et al., 2011). Consequently, we obtain multiple observations both for the respective event dates and for the firms in our sample. As regulatory measures affect all firms on the same date, returns are likely to be cross-sectionally correlated (e.g. MacKinlay, 1997) which might lead to biased standard errors (Gow, Ormazabal, & Taylor, 2010; Petersen, 2009). To address the correlation of MARs in the multi-event analysis, we follow the recommendation by Gow et al. (2010) and use bootstrapped standard errors clustered by event (Cameron, Gelbach, & Miller, 2008).[7]

Similar to our univariate analysis, we assess significance of our findings using traditional t-statistics, and two additional test statistics from a Monte-Carlo simulation using non-overlapping non-event windows to address potential misspecification, that is, MARs being correlated with variables of interest absent regulatory action (e.g. Larcker et al., 2011). We simulate the distribution of the coefficients on our variables of interest and control variables based on randomly selected non-event windows for the pooled event analysis. We estimate our regression for seven randomly selected non-event windows, and repeat this procedure 1000 times to generate the non-event distribution of our

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[6] For events that decrease the likelihood / scope of the regulation, MAR is multiplied by negative one.

[7] Joos and Leung (2013) and Larcker et al. (2011) also cluster standard errors at the event date to deal with the correlation of MARs in the multi-event analysis. Because we do not have a sufficient number of clusters (e.g., Gow et al., 2010; Petersen, 2009), we bootstrap the clustered standard errors (Cameron et al., 2008; Gow et al., 2010). Results remain unchanged when using bootstrapped standard errors clustered by event and firm.

coefficients (Cai & Walkling, 2011; Zhang, 2007). For the second test, we establish whether the coefficient estimates based on the event-date regression differ from the simulated coefficient estimates obtained using non-event date returns.[8] For the third test statistic, we calculate bootstrap p-values for coefficients on our variables of interest and control variables based on the simulated coefficient estimates.

4.3 Variables measurement

ABNORMAL PAY is defined as the two-year average of the residuals from estimating the following regression (Cai & Walkling, 2011):[9]

$$\text{AVERAGE PAY}_{it} = \beta_0 + \beta_1 \text{SIZE}_{it} + \beta_2 \text{ROA}_{it} + \beta_3 \text{STOCK RETURN}_{it} + \beta_4 \text{MTB}_{it} +$$

$$\sum \text{industry} + \sum \text{year} + \mu \qquad (2)$$

The underlying assumption here is that the level of executive compensation is determined by size (SIZE), accounting performance (ROA), stock performance (STOCK RETURN), growth opportunities (MTB) in the respective year, and industry and year fixed effects[10]. This is consistent with recent evidence by Rapp and Wolff (2010), who find that more than 60% of the variation in the level of executive compensation in Germany is explained by size, year, and industry. AVERAGE PAY is defined as the natural logarithm of average board executive compensation (thousands of euros). Average executive compensation is total executive board compensation divided by the number of board members. Total board compensation includes fixed components, such as the salary and, for example, contributions to the D&O insurance, and variable components,

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[8]   In addition, we also apply the procedure used by Armstrong et al. (2010) and Joos and Leung (2013) and test whether the coefficient estimates based on the event-date regression differ from coefficient estimates obtained using non-event date returns for the pooled event analysis. Our results are similar to those obtained from the second test statistic.

[9]   Similar approaches are applied by Core, Holthausen, and Larcker (1999) and Ferri and Maber (2013). We use the two-year average for years 2006 and 2007 to estimate the level of ABNORMAL PAY, since detailed disclosure of executive compensation only became mandatory in 2006, when the VorstOG was introduced. This restriction also applies to the estimation of PAY SENSITIVITY. Also, we do not use 2008 compensation data for two reasons. First, the 2008 financial crisis is likely to be reflected in the level of executive compensation. Second, at least for events 1 - 3, we need to rule out any look-ahead bias (Larcker et al., 2011), that is, we use only data in our tests that were available to the market participants when regulatory discussions occured. Still, we note that inferences are similar when using a two-year average for 2007 and 2008 instead of 2006 and 2007 when 2008 data are available to market participants and the re-estimated ABNORMAL PAY is significantly negative for the single event and pooled analysis (5% level and 1% level, respectively).

[10]  We also computed abnormal pay using an augmented version of model (2) that also includes FREE FLOAT and bluechip index membership (DAX) as explanatory variables. Using this augmented measure yielded essentially the same results for all our multivariate analyses as did the original measure based on model (2).

such as short-term cash bonuses, payments based on long-term performance, and equity-related compensation, in particular stock options granted. Not included are, for example, pension related expenses, because they are not consistently disclosed by firms, and in particular severance payments, as these represent extraordinary compensation which is not reflective of managerial performance in the respective year. SIZE and MTB are defined as stated in the previous section, ROA is the return on assets (i.e. net income plus interest expense divided by average total assets), and STOCK RETURN is the stock return for the past year including dividend payments. We use binary variables to include industry-effects and year-effects. The level of 'abnormal' (excessive) pay is the fraction of the level of executive compensation that is not explained by the model outlined above. We estimate the regression model using data for the years 2006 and 2007 for all firms listed in the Prime Standard segment on the Frankfurt Stock Exchange for which the required data were available.[11]

To assess the sensitivity of executive compensation to firm performance, we need to estimate the relation of the change in board members' wealth to the change in shareholder wealth. Jensen and Murphy (1990) define this pay-performance sensitivity as 'the dollar change in the CEO's wealth associated with a dollar change in the wealth of shareholders'. Ideally, we would therefore measure the sensitivity of board members' equity portfolios to changes in stock price (see, e.g. Core & Guay, 1999). However, for the German setting, data on managers' equity portfolios are not available.[12] Instead, as noted, listed firms are mandated to disclose the total amount of compensation, which includes fixed payments, cash bonuses, and components related to long-term performance. The latter category includes, for example, bonuses based on horizons of over one year, but also values from phantom-stocks or stock options granted. Therefore, while we are unable to track managers' equity portfolios, we have available a compensation metric that comprises both short-term bonus payments and long-term rewards from managerial effort, including equity incentives.[13] Accordingly, we measure pay-performance sensitivity as the percentage change of variable compensation (i.e. cash

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[11]   Results remain unchanged when restricting the sample for estimating ABNORMAL PAY to the 203 firms included in our final sample.

[12]   Rapp, Schaller, and Wolff (2011) observe that executive compensation components based on stock performance were only used by 37.4% of firms listed in the Prime Standard.

[13]   In our robustness Section 2.5.3, we address potential concerns with the inclusion of the fair value of stock options granted by calculating the pay-performance sensitivity based on cash compensation only.

bonuses and components related to long-term performance) divided by the change in total shareholder return of the respective firm. However, we need to caution that this measure is a potentially biased or weak indicator of the construct pay-performance sensitivity. First, as noted, we are unable to track the changes in managerial wealth directly. Second, we rely on data on compensation awarded, rather than being able to observe the underlying contracts and how effectively they actually tie compensation to measures of managerial performance.

Free float shares (FREE FLOAT) are the percentage of shares of the respective class of shares available to investors, namely shares outstanding less strategic holdings. Following the free float definition of the German Stock Exchange used since 2002, strategic holdings are holdings of at least 5% of the shares outstanding. We use the percentage of free float shares on the respective event date. Table 2.1 summarizes and details all variables used in our empirical analyses.

**Table 2.1:** Variables measurement

| Variable | Definition |
| --- | --- |
| MAR | Market-adjusted return over a three-day window around the respective event date using the FTSE World Europe excluding Germany as a proxy for the market portfolio, winsorised at the 1% and 99% levels[1] |
| ABNORMAL PAY | Two-year average of the residuals of the following regression: AVERAGE PAY = $\beta_0$ + $\beta_1$ SIZE + $\beta_2$ ROA + $\beta_3$ STOCK RETURN + $\beta_4$ MTB + industry + year + $\mu$ |
| AVERAGE PAY | Natural logarithm of average executive compensation (total executive compensation divided by the number of executive board members) in thousands of euros |
| SIZE | Natural logarithm of market capitalisation in thousands of euros |
| ROA | Return on assets, that is, net income plus interest expense on debt divided by average total assets |
| STOCK RETURN | One-year stock return including dividend payments |
| MTB | Market-to-book ratio, that is, market capitalisation divided by common shareholders' equity |
| industry | Binary variables indicating the SIC division of the respective firm |
| year | Binary variables indicating the respective year |
| HIGH ABNORMAL PAY | Binary variable indicating that the firm's ABNORMAL PAY is in the top quintile |
| LOW ABNORMAL PAY | Binary variable indicating that the firm's ABNORMAL PAY is in the bottom quintile |
| PAY SENSITIVITY | Percentage change of average variable compensation divided by the change in total shareholder return, winsorised at the 1% and 99% levels[2] |
| FREE FLOAT | Percentage of free-float shares, that is, shares outstanding less strategic holdings (holdings of at least 5% of the shares outstanding) on the respective event date |
| MOMENTUM | Six months MAR prior to the respective event date |
| DAX | Binary variable indicating the firm's participation in the German blue chip index DAX on the respective event date |
| CAR | Cumulative abnormal return over a three-day window around the respective event date, estimated by using the market model with a 250-trading-day estimation period and the FTSE World Europe excluding Germany as a proxy for the market portfolio, winsorised at the 1% and 99% levels[1] |
| EXCESS PAY | Two-year average of the natural logarithm of average executive compensation less the median natural logarithm of average executive compensation of the respective firm's industry and size tercile |
| ABNORMAL CEO PAY | Two-year average of the residuals of the following regression: CEO PAY = $\beta_0$ + $\beta_1$ SIZE + $\beta_2$ ROA + $\beta_3$ STOCK RETURN + $\beta_4$ MTB + industry + year + $\mu$, where CEO PAY equals the natural logarithm of CEO compensation in thousands of euros |
| ABNORMAL PAY (Employees) | Two-year average of the residuals of the following regression: AVERAGE PAY = $\beta_0$ + $\beta_1$ SIZE (Employees) + $\beta_2$ ROA + $\beta_3$ STOCK RETURN + $\beta_4$ MTB + industry + year + $\mu$, where SIZE (Employees) equals the natural logarithm of the number of employees |
| ABNORMAL PAY (Sales) | Two-year average of the residuals of the following regression: AVERAGE PAY = $\beta_0$ + $\beta_1$ SIZE (Sales) + $\beta_2$ ROA + $\beta_3$ STOCK RETURN + $\beta_4$ MTB + industry + year + $\mu$, where SIZE (Sales) equals the natural logarithm of sales |
| CEO PAY SENSITIVITY | Percentage change of CEO variable compensation divided by the change in total shareholder return, winsorised at the 1% and 99% levels[2] |
| PAY SENSITIVITY (Average total compensation) | Percentage change of average total compensation divided by the change in total shareholder return, winsorised at the 1% and 99% levels[2] |
| PAY SENSITIVITY (Average cash compensation) | Percentage change of average cash compensation (i.e., fixed salary and short-term bonuses) divided by the change in total shareholder return, winsorised at the 1% and 99% levels[2] |

[1]MAR and CAR are winsorised at the 1% and 99% levels to reduce the impact of outliers.
[2]Variables are winsorised at the 1% and 99% levels to reduce the impact of outliers.

## 2.4.3 Identification of events

To identify events that changed the likelihood or / and the scope and content of the regulation, we adopted a two-step approach, (1) database research of governmental / legislative announcements, and (2) media analysis using the LexisNexis database and the print version of the 'Handelsblatt', the major daily financial newspaper in Germany. The source of regulation in our setting were the conservative (CDU/CSU) and the social democratic (SPD) parties which formed the then ruling coalition government (in charge from November 2005 until October 2009). Therefore, in a first step, we conducted a database analysis of all official pronouncements and press releases by the coalition government and its two parties for the two years prior to parliament adoption of the VorstAG on 18 June 2009, using keywords for different phrasing of the term 'executive compensation'. This search resulted in a total of 16 observations. Out of these, we eliminated the first seven announcements (published between 13 December 2007 and 19 August 2008), as these reflected disagreement between the ruling coalition parties. While the social democrats favored regulation of executive compensation (press releases from SPD, 13 December 2007, 17 January 2008, 4 April 2008, 19 August 2008), in particular with respect to putting a ceiling on presumably 'excessive' compensation, party officials of the conservatives publicly disagreed and stated the compensation issues should better be left to private parties (press releases from CDU/CSU, 17 January 2008, 27 April 2008, 28 April 2008). This underscores the unexpected character of the first event we chose to include, the joint announcement of party officials from both social democrats and conservatives on 26 September 2009 to install a coalition working group with the intent of regulating executive compensation (event No. 1). With this event, it became clear that, contrary to expectations, executive compensation would be regulated by the coalition government and would, among other things, involve efforts to meet the long-standing demands of social democrats to curb 'excessive' compensation arrangements. This event was followed by four meetings of the coalition task force. These meetings were concerned with drafting the proposed legislation and ensuing alterations and specifications (event Nos. 2, 4, 5, and 6), publication of the first draft law (event No. 3), and by the eventual adoption of the VorstAG by the German Parliament on 18 June 2009 (event No. 7). Two ensuing events which we chose not to include as they did not potentially bear on the regulation relate to a procedural statement by the second house of the German Parliament (10 July 2009) and the eventual publication of the law (5 August 2009).

Step two of our identification approach was a media analysis. Using the LexisNexis database, and searching 'Handelsblatt', we confirmed that the seven events we chose for our analyses received instant, broad coverage in the national news, in newspapers, and online media. We then applied the same keyword search as in step one to scan the two-year period prior to adoption of the VorstAG for media mentioning of critical events relating to the regulation of executive compensation. This analysis yielded no additional events and confirmed our event selection from step one. Panel A of Table 2.2 reports the dates and nature of these seven events we use for our analyses. Also, it reports for each event whether it presumably increased or decreased the likelihood or scope of the regulation, based on a detailed impact assessment.

Details of the impact assessment are reported in Panel B of Table 2.2. Following event identification, the impact assessment was performed to establish how or whether each of the seven events potentially bore down on market perceptions of regulation likelihood and / or the scope and content of the regulation. While events Nos. 1 (first-time announcement of the regulatory intent) and 7 (adoption of the legal act by the German Parliament) significantly increased the likelihood of the regulation, the five events in between mainly altered the expected scope and content of the regulation. For each of these five events, we assessed whether it increased or decreased the expected scope and content of the regulation. Panel B of Table 2.2 documents this assessment and gives a detailed account of all issues related to management compensation that were discussed over these events. Not untypical for law-making processes, this analysis reveals that following the first proposals by the task force (event No. 2), the array of proposed measures decreased over the following events (event Nos. 3-6).

**Table 2.2:**   Events leading to the VorstAG

*Panel A: Events leading to the VorstAG*

| Event No. | Date | Event | Assessed impact on the likelihood / scope of the VorstAG |
|---|---|---|---|
| 1 | 09/26/2008 | Announcement of regulatory intent (First-Time Announcement) | + |
| 2 | 01/29/2009 | Proposal of amendments to the regulation of executive compensation | + |
| 3 | 03/17/2009 | Publication of the draft law | - |
| 4 | 04/23/2009 | Specification of the draft law | - |
| 5 | 05/07/2009 | Specification of the draft law | - |
| 6 | 05/29/2009 | Specification of the draft law | - |
| 7 | 06/18/2009 | Passage of the VorstAG in the German Parliament | + |

*Panel B: Impact assessment*

| Measures | | Event No. 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| **Increased and specified liability of supervisory board members for executive compensation** | | x | x | x | x | x | x | x |
| **Regulation of executive compensation** | | | | | | | | |
| 1. | Increased holding-period for stock options / long-term incentives | x | x | x | x | x | x | x |
| 2. | Performance-based executive compensation (long-term incentives) geared towards a sustainable firm development | | x | x | x | x | (x) | (x) |
| 3. | *Executive compensation in proportion to 'customary' executive compensation* | | | *x* | *x* | *x* | *x* | |
| 4. | Executive compensation should not exceed 'customary' executive compensation | | | | | | | x |
| 5. | Explicit reference to the interests of employees, shareholders and general public | | o | o | o | | | |
| 6. | *Performance-related executive compensation only to be paid upon expiration of the contract* | | | | *x* | *x* | *x* | *(x)* |
| 7. | Simplified ex-post reduction of executive compensation[1] | | x | x | x | x | (x) | (x) |
| **Restriction of the tax deductibility of executive compensation** | | o | o | (o) | | | | |
| **Extented disclosure regulation with respect to executive compensation to increase transparency** | | x | x | x | x | x | x | x |
| **Non-binding 'say on pay'** | | o | o | o | o | o | x | x |

Notes: Panel A shows the events leading to the VorstAG, and our assessed impact of the respective events on the likelihood or scope and content of the regulation based on the analysis as reported in Panel B. Panel B shows the detailed analysis of the development of the scope and content of the VorstAG. x indicates measures that were agreed upon and o indicates measures that were considered. (x) and (o) indicate that the likelihood / scope of measures was reduced. Measures that were criticised as counterproductive are in italic letters.

[1] The simplified ex-post reduction of executive compensation includes caps that prevent excessive payments in case of an 'extraordinary development' and the (voluntary) requirement for the supervisory board to reduce compensation in case of financial / economic distress.

## 2.5 Empirical findings

### 2.5.1 Sample selection and data collection

We examine market reactions for firms listed in the Prime Standard of the Frankfurt stock exchange. We restrict our sample to firms that were consistently listed over the years 2005 - 2009, because we require market data from 2005 onwards to perform our analyses (i.e. the calculation of MARs, the test variables, and control variables used). This results in an initial sample of 316 firms. We eliminate 33 foreign firms, since these are not affected by the VorstAG. Also, we exclude preferred shares of 22 firms to avoid double counting, and 9 firms that have the legal form of a KGaA (partnership limited by shares), with specific governance structures that limit comparability with the other sample firms. Twelve firms are eliminated due to bankruptcy or mergers. Additional sample reductions result from lack of data and from methodological requirements. Sixteen firms are eliminated due to missing compensation data, 17 firms because of missing market data,[14] and 2 firms because financial reports were no longer available. Finally, we exclude 1 bank (Commerzbank) from our sample because executive compensation was capped to 500,000 euros, as the bank received state support in the wake of the financial crisis, as stipulated under a specific law act (Finanzmarktstabilisierungsgesetz) in 2008.[15] We obtain a sample of 203 firms (23 financial firms). To preclude that our results are driven by confounding events, we exclude firm observations if the respective firm published its annual or interim report in the respective event window. This leads to 202 observations for our analysis of event No. 1, and 1,353 firm-event observations for the pooled event analysis. Details on the number of firms eliminated on each event can be inferred from Table 2.4, which displays the number of firms examined on each event.

Market price information, balance sheet data, and the data on ownership dispersion (FREE FLOAT) are obtained from Thomson Reuters Datastream. The definition of FREE FLOAT is consistent with the definition of the stock exchange, Deutsche Börse. Details on management compensation are hand-collected from financial reports. For our main analyses, we use average board compensation metrics, that is, we divide total

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[14]   To generate reasonable estimates for the industry fixed effects, six of these firms are excluded because they operate in industries with no more than three firms. For example, Core et al. (1999, p. 377) also exclude firms from industries with less than 10 firms in order to calculate reasonable estimates for their industry effect variables.

[15]   Additionally, we exclude another firm (Conergy) that was in financial distress from November 2007 on, requiring substantial amounts of liquidity, followed by accusations of balance sheet fraud in 2009, and accompanied by substantial losses in market value from late 2007 on.

compensation (and its three components fixed salary, cash bonuses, and long-term incentive pay) by the number of board members. Also, for our robustness checks, we collect the relevant compensation data for CEOs only.

Panel A of Table 2.3 reports descriptive statistics for the variables of our determinants model based on the pooled sample (N = 1353), and Panel B of Table 2.3 reports pairwise Pearson correlations. Mostly, these correlations are as expected. However, we note a high correlation between the DAX and SIZE variables of 0.7085. Ensuing analyses yield variance inflation factors (VIFs) of 2.33 for SIZE and 2.23 for DAX, which raises no concerns with respect to multicollinearity.[16]

**Table 2.3:** Descriptive statistics

*Panel A: Descriptives*

| | Mean | Standard deviation | First quartile | Median | Third quartile | N |
|---|---|---|---|---|---|---|
| ABNORMAL PAY | 0.0063 | 0.4312 | -0.2794 | 0.0228 | 0.2700 | 1353 |
| PAY SENSITIVITY | -0.3078 | 3.5420 | -0.4065 | -0.0162 | 0.2095 | 1353 |
| FREE FLOAT | 0.6053 | 0.2575 | 0.4300 | 0.6000 | 0.8200 | 1353 |
| SIZE (in millions) | 3506.88 | 11526.61 | 39.78 | 149.04 | 1000.59 | 1353 |
| MTB | 1.7274 | 2.1464 | 0.7699 | 1.2397 | 1.9167 | 1353 |
| MOMENTUM | 0.0518 | 0.3138 | -0.1326 | 0.0170 | 0.1979 | 1353 |
| DAX | 0.1212 | 0.3265 | 0.0000 | 0.0000 | 0.0000 | 1353 |

*Panel B: Correlations*

| | | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|---|
| ABNORMAL PAY | (1) | **1.0000** | | | | | | |
| PAY SENSITIVITY | (2) | -0.0435 | **1.0000** | | | | | |
| FREE FLOAT | (3) | **0.0978** | **0.0543** | **1.0000** | | | | |
| SIZE | (4) | -0.0058 | -0.0035 | **0.1705** | **1.0000** | | | |
| MTB | (5) | **-0.0533** | 0.0388 | **-0.1031** | 0.0576 | **1.0000** | | |
| MOMENTUM | (6) | -0.0182 | -0.0150 | -0.0180 | -0.0257 | -0.0120 | **1.0000** | |
| DAX | (7) | 0.0396 | 0.0042 | **0.2667** | **0.7085** | 0.0190 | -0.0140 | **1.0000** |

Notes: Panel A shows descriptive statistics and Panel B reports Pearson correlations for the variables included in the regressions (N = 1353). Definitions of variables are reported in Table 2.1. In Panel A, SIZE is reported without the natural logarithm. In Panel B, bold values indicate two-tailed significance at the 10% level.

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[16] Multicollinearity tests are performed for all explanatory variables in regression model (1) for the pooled sample (N=1353) without bootstrapping. VIFs for variables other than SIZE and DAX are below 2.00 and mean VIF is 1.39. Thus, inferences are not affected by multicollinearity concerns (e.g. Gujarati, 2003, p. 362).

## 2.5.2 Empirical findings

### 2.5.2.1 Market reactions to regulatory events

Table 2.4 reports the three-day MARs around the events leading to the adoption of the VorstAG. To ease the interpretation of the results, returns are multiplied by negative one for events that decreased the probability or the scope and content of the regulation. The analyses reveal that average MARs are negative and significantly different from zero only for event No. 1 (first-time announcement) and for event No. 7 (passage of the VorstAG in the German Parliament), the two most prominent events with respect to the likelihood of the regulation. The aggregate mean market reaction over all seven events is negative, and statistically different from zero, and also statistically different from the simulated mean MARs from the Monte-Carlo simulation. In contrast, our third test statistic, the weighted bootstrap p-value, indicates that 28.9% of the average MARs for seven random non-event windows are lower than the mean event-window return. Taken together, these findings document that at the aggregate market level, we find no evidence of a positive reaction of shareholders to the proposed regulation.[17] Thus, our findings do not support H1 that firm value increases with the increased likelihood or scope and content of the regulation of executive compensation.[18]

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[17] When we exclude financial firms from the sample, the aggregated market reaction remains negative and is statistically insignificant. We also re-estimate the overall market reaction using a one-day event window. The overall market reaction is significantly negative (10% level).

[18] To shed further light on the market reactions conditional on the level of executive compensation, we form five portfolios based on quintiles for our test variable ABNORMAL PAY. In this analysis, which is conducted both for the first-time announcement and for the pooled sample, we find that market reactions are not significant for the first three portfolios. For the fourth portfolio, market reactions are significantly different from zero on the first-time announcement. For the portfolio with presumably highly overpaid executives (portfolio 5), market reactions are significantly negative for the first-time announcement and the pooled event analysis. This indicates that market reactions are mainly driven by firms with presumably overpaid executive board members. Also, this finding might explain why we fail to find significant market reactions based on the weighted bootstrap p-value in Table 2.4. The multivariate analyses in the following sections shed more light on this.

**Table 2.4:**  Market reactions around regulation-related events

| Event No. | Date | Impact on likelihood / Scope | Raw return | Market Return (FTSE World Europe ex Germany) | MAR | t-statistic (vs. 0) | N |
|---|---|---|---|---|---|---|---|
| 1 | 09/26/2008 | + | -0.0753 | -0.0522 | -0.0231 | (-4.64)*** | 202 |
| 2 | 01/29/2009 | + | 0.0198 | 0.0167 | 0.0031 | (0.87) | 195 |
| 3 | 03/17/2009 | - | -0.0175 | -0.0146 | -0.0029 | (-0.76) | 193 |
| 4 | 04/23/2009 | - | -0.0315 | -0.0338 | 0.0023 | (0.58) | 193 |
| 5 | 05/07/2009 | - | -0.0271 | -0.0265 | -0.0006 | (-0.13) | 175 |
| 6 | 05/29/2009 | - | -0.0157 | -0.0186 | 0.0030 | (0.96) | 194 |
| 7 | 06/18/2009 | + | -0.0071 | -0.0009 | -0.0062 | (-2.12)** | 201 |
| | | Mean MAR | | | -0.0037 | | |
| | | t-statistic (vs. 0) | | | (-2.43)** | | |
| | | t-statistic (vs. non-events) | | | (-3.65)*** | | |
| | | Weighted bootstrap p-value (1000 repetitions) | | | [0.289] | | |

Notes: This table reports mean three-day MARs on the respective event dates using the FTSE World Europe excluding Germany as the market index. The t-statistics (vs. non-events) and bootstrap p-values are obtained from Monte-Carlo simulation, that is, 1000 repetitions of computing mean MARs over seven randomly selected three-day non-event windows from September 2008 to June 2009. For the t-statistics (vs. non-events) we test whether event-date MARs equal mean MARs on non-events obtained from Monte-Carlo simulation. The weighted bootstrap p-value is the weighted percentage of simulated MARs over non-events that are lower than the average MARs over our seven event dates. For events that decrease the likelihood / scope and content of the regulation, returns are multiplied by negative one to ease interpretation. Variables are reported in Table 2.1. ***, **, and * indicate two-tailed significance at the 1%, 5%, and 10% levels, respectively. For the weighted bootstrap p-values, ***, **, and * indicate one-tailed significance at the 1%, 5%, and 10% levels, respectively.

### 2.5.2.2  Multivariate analyses

*Single-event analysis: First-time announcement of regulatory intent*

Table 2.5 reports results from estimating our determinants model (1) for the first-time announcement of regulatory intent on 26 September 2008. We use four different model specifications, the original model (1), model (2), where we replace ABNORMAL PAY with two binary variables for the top and bottom quintile of ABNORMAL PAY, and model (3), where we estimate the original model (1) for a reduced sample of non-financial firms.[19] In model (4), we estimate the original model (1), but with a one-day event window instead of three days. This is to address a potentially confounding effect, as the first-time announcement of regulatory intent on Friday, 26 September 2008, was followed by the so-called Black Monday on the next trading day, Monday, 29 September 2008, one of the key events during the financial crisis (in particular in the USA, where the S&P 500 dropped 8.8 % on this very day). For the main model (1), adjusted

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[19]  When estimating ABNORMAL PAY for model (3), financial firms are also excluded.

$R^2$ ($R^2$) is 0.17 (0.22), with similar values for models (2) and (4) and lower values for model (3). This suggests a reasonable model fit. Related studies establish comparable explanatory power for the analysis of single events, with adjusted $R^2$s from 0.01 to 0.32 (Zhang, 2007), and $R^2$s ranging from 0.12 to 0.14 (Cai & Walkling, 2011).[20]

**Table 2.5:** First-time announcement

| *Variables* | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| ABNORMAL PAY | -0.025 | | -0.016 | -0.010 |
| | (-2.37)** | | (-1.48) | (-2.41)** |
| HIGH ABNORMAL PAY | | -0.020 | | |
| | | (-1.77)* | | |
| LOW ABNORMAL PAY | | 0.014 | | |
| | | (1.23) | | |
| PAY SENSITIVITY | -0.000 | -0.000 | 0.000 | 0.001 |
| | (-0.20) | (-0.25) | (0.05) | (2.21)** |
| *Controls* | | | | |
| FREE FLOAT | -0.029 | -0.029 | -0.042 | -0.015 |
| | (-1.46) | (-1.44) | (-2.05)** | (-1.79)* |
| SIZE | -0.003 | -0.003 | -0.002 | -0.000 |
| | (-1.02) | (-1.03) | (-0.62) | (-0.26) |
| MTB | -0.000 | 0.000 | -0.000 | -0.000 |
| | (-0.17) | (0.07) | (-0.46) | (-1.26) |
| MOMENTUM | 0.091 | 0.093 | 0.073 | 0.033 |
| | (3.75)*** | (3.76)*** | (2.63)*** | (3.25)*** |
| DAX | 0.025 | 0.025 | 0.021 | 0.004 |
| | (0.98) | (0.98) | (0.83) | (0.57) |
| *Intercept* | | | | |
| CONS | 0.054 | 0.055 | 0.048 | 0.020 |
| | (1.36) | (1.40) | (1.25) | (1.16) |
| N | 202 | 202 | 179 | 203 |
| $R^2$ | 0.22 | 0.22 | 0.17 | 0.23 |
| Adjusted $R^2$ | 0.17 | 0.17 | 0.11 | 0.18 |
| Banks | included | included | no | included |
| Event window | 3 days | 3 days | 3 days | 1 day |
| Industry fixed effects | yes | yes | yes | yes |
| Robust Std. Err. | yes | yes | yes | yes |

Notes: This table reports the results from regressing three-day MARs (-1/+1) (one-day MARs in model (4)) around the first-time announcement (09/26/2008) on proxy variables for the quality of executive compensation and various control variables using industry fixed effects and robust standard errors. Definitions of variables are reported in Table 2.1. T-values are reported in parentheses.

*** Two-tailed significance at the 1% level from testing whether coefficients are different from zero.

** Two-tailed significance at the 5% level from testing whether coefficients are different from zero.

* Two-tailed significance at the 10% level from testing whether coefficients are different from zero.

The coefficient on our main test variable ABNORMAL PAY is significantly negative (5% level) for model (1), while the coefficient on PAY SENSITIVITY is insignifi-

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[20]    Larcker et al. (2011) do not report $R^2$s.

cant.[21] Results for model (2) yield some insights into the drivers of the negative association of abnormal pay with market returns. We find that the coefficient on the top quintile of ABNORMAL PAY is negative and weakly significant (10% level), suggesting that the negative association of abnormal pay and market returns is rather driven by firms with presumably 'overpaid' executives. For our analysis of non-financial firms only (model (3)), results are weaker than for the full sample. The coefficient on AB-NORMAL PAY turns out negative but statistically insignificant. For model (4), which investigates market reactions solely on the event date, the coefficient on the test variable ABNORMAL PAY turns out significantly negative (5% level) and the coefficient on PAY SENSITIVITY becomes significantly positive (5% level).[22] As these one-day event window results are consistent with the findings for the three-day event window, we are able to rule out that our results are confounded by contemporary events related to the financial crisis.

Control variables that turn out significant are FREE FLOAT (negative coefficient, models (3) and (4)) and MOMENTUM (positive coefficient). The negative coefficient on FREE FLOAT indicates that firms with high ownership dispersion react more negatively to the first-time announcement of the regulation.

*Pooled multi-event analysis*

Table 2.6 reports the results from estimating our determinants models for the pooled sample of all seven events, using bootstrapped standard errors clustered by event (Cameron et al., 2008).[23] Adjusted $R^2$ ($R^2$) for models (1) and (3) is 0.02 (0.03), while adjusted $R^2$ for model (2) is slightly larger. Again, the explanatory power of our models is in line with the analyses of multiple events in similar studies where adjusted $R^2$s range from 0.01 (Joos & Leung, 2013) to 0.17 (Zhang, 2007). Armstrong et al. (2010) also examine multiple events and report an $R^2$ of 0.03.

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[21] We also estimate model (1) without control variables for ABNORMAL PAY and PAY SENSITIVITY separately, and for both test variables. For all re-estimations, results remain basically unchanged.

[22] When comparing coefficients from model (1) to coefficients from 21 non-overlapping non-events in 2008, results are confirmed. The test statistic indicates that ABNORMAL PAY is different from ABNORMAL PAY on non-events at the 5% level.

[23] In additional tests, we re-estimate model (1) without control variables for ABNORMAL PAY and PAY SENSITIVITY separately, and for both test variables. For all re-estimations, results remain basically unchanged.

**Table 2.6:** Pooled multi-event analysis

| Variables | (1) | (2) | (3) |
|---|---|---|---|
| ABNORMAL PAY | -0.012 | | -0.010 |
| | (-2.73)*** | | (-3.08)*** |
| HIGH ABNORMAL PAY | | -0.013 | |
| | | (-2.90)*** | |
| LOW ABNORMAL PAY | | 0.004 | |
| | | (1.44) | |
| PAY SENSITIVITY | 0.001 | 0.001 | 0.001 |
| | (1.93)* | (1.89)* | (2.17)** |
| *Controls* | | | |
| FREE FLOAT | -0.018 | -0.017 | -0.021 |
| | (-1.95)* | (-1.84)* | (-1.86)* |
| SIZE | -0.002 | -0.002 | -0.002 |
| | (-1.39) | (-1.44) | (-1.26) |
| MTB | -0.000 | -0.000 | -0.001 |
| | (-0.67) | (-0.31) | (-1.17) |
| MOMENTUM | 0.007 | 0.007 | 0.004 |
| | (0.49) | (0.55) | (0.37) |
| DAX | 0.011 | 0.010 | 0.008 |
| | (1.03) | (0.99) | (0.80) |
| *Intercept* | | | |
| CONS | 0.040 | 0.041 | 0.038 |
| | (1.83)* | (1.87)* | (1.75)* |
| N | 1353 | 1353 | 1195 |
| $R^2$ | 0.03 | 0.04 | 0.03 |
| Adjusted $R^2$ | 0.02 | 0.03 | 0.02 |
| Banks | included | included | no |
| Industry fixed effects | yes | yes | yes |
| Clustered Std. Err. | event | event | event |

Notes: This table reports the results from regressing three-day MARs (-1/+1) around the identified event dates on proxy variables for the quality of executive compensation and various control variables using industry fixed effects and bootstrapped standard errors (1000 repetitions) clustered at the event-level. Definitions of variables are reported in Table 2.1. Z-values are reported in parentheses.

*** Two-tailed significance at the 1% level from testing whether coefficients are different from zero.

** Two-tailed significance at the 5% level from testing whether coefficients are different from zero.

* Two-tailed significance at the 10% level from testing whether coefficients are different from zero.

Consistent with the results for the single-event analysis, estimation of model (1) yields a negative and strongly significant coefficient for our main test variable ABNORMAL PAY. The economic effect of one standard deviation change in ABNORMAL PAY is -0.52% and thus larger than for the other variables included in model (1). The coefficient estimate for the test variable PAY SENSITIVITY turns out positive and significant at the 10% level. For model (2), we find a significantly negative coefficient on HIGH ABNORMAL PAY, the indicator variable for firms in the top quintile of ABNORMAL

PAY (1% level). The coefficient for the lowest quintile (LOW ABNORMAL PAY) is insignificant. Again, this finding suggests that the negative coefficient on ABNORMAL PAY in model (1) is driven by firms with high levels of 'overpayment', which experience decreases in economic value upon announcement of regulatory intent. In contrast to the single-event analysis, we now also find a significant negative (positive) coefficient on our variable ABNORMAL PAY (PAY SENSITIVITY) (1% and 5% level, respectively) for the subsample of non-financial firms (model (3)). This leads us to rule out that our main results are primarily driven by financial firms.[24] The coefficient on FREE FLOAT turns out significantly negative across all models, while the coefficient on MOMENTUM does not.

Results from the Monte-Carlo simulation in Table 2.7 confirm the results from traditional test statistics with respect to ABNORMAL PAY. We find that the coefficient on ABNORMAL PAY from model (1) in Table 2.7 is significantly smaller on the event dates, as compared to its non-event distribution. The coefficient on PAY SENSITIVITY differs significantly from the mean coefficient obtained from the Monte-Carlo simulation (second test statistic).

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[24]  Untabulated pooled regression estimates for the sample of financial firms confirm this result, yielding coefficient estimates in line with our full sample analyses. We also estimated models (1) and (3) for event Nos. 2-7 to rule out that results are driven by event 1, which may be confounded due to the financial crisis. We find that the coefficient on ABNORMAL PAY is significantly negative (5% level) and the coefficient on PAY SENSITIVITY is significantly positive at the 10% level (5% level) in model (1) (model (3)). These slightly weaker results are not surprising since the first-time announcement is our main event where the regulatory intent was announced for the first time.

**Table 2.7:**  Monte-Carlo simulation for the pooled multi-event analysis

| Variables | Coefficients from model (1) | Average coefficients from the simulation of non-events (1000 rep.) | (p-value) [bootstrap p-value] |
|---|---|---|---|
| ABNORMAL PAY | -0.012 | -0.001 | (0.011)** |
|  |  |  | (0.004)*** |
| PAY SENSITIVITY | 0.001 | 0.000 | (0.044)** |
|  |  |  | (0.132) |
| *Controls* |  |  |  |
| FREE FLOAT | -0.018 | -0.001 | (0.059)* |
|  |  |  | (0.081)* |
| SIZE | -0.002 | -0.000 | (0.202) |
|  |  |  | (0.176) |
| MTB | -0.000 | -0.000 | (0.796) |
|  |  |  | (0.451) |
| MOMENTUM | 0.007 | -0.012 | (0.170) |
|  |  |  | (0.158) |
| DAX | 0.011 | 0.000 | (0.301) |
|  |  |  | (0.166) |
| *Intercept* |  |  | (0.307) |
| CONS | 0.040 | 0.008 | (0.140) |
|  |  |  | (0.199) |
| Banks | Included | Included |  |
| Industry fixed effects | Yes | Yes |  |
| Clustered Std. Err. | Event | Event |  |

Notes: This table compares the results from the main model (1) (Table 2.6) for the multi-event analysis to mean coefficients obtained from Monte-Carlo Simulation. Simulated coefficients are average coefficients drawn from 1000 repetitions of randomly selecting seven non-events. P-values are the results from comparing the coefficients from model (1) to the average coefficients from the simulation and are reported in parentheses. Bootstrap p-values are the percentage of coefficients drawn from 1,000 repetitions of randomly selecting seven non-events that are higher (for positive coefficients) or lower (for negative coefficients) than those of the main model. Definitions of variables are reported in Table 2.1. ***, **, and * indicate two-tailed significance at the 1%, 5%, and 10% levels, respectively. For the bootstrap p-values, ***, **, and * indicate one-tailed significance at the 1%, 5%, and 10% levels, respectively.

### 2.5.2.3    Discussion

Our consistent findings of a significantly negative coefficient on our main test variable ABNORMAL PAY indicate that 'excess' compensation is negatively associated with market value reactions to an increased likelihood or scope and content of the regulation. This leads to rejecting our second hypothesis H2 that shareholders associate benefits with the regulation for those firms which are particularly affected. Moreover, this evidence is consistent with the Larcker et al. (2011) findings for the USA, which apparently translate to other jurisdictions and governance systems such as Germany. However, by partitioning our measure of abnormal compensation in model (2), we go beyond

Larcker et al. (2011), and reveal that market value discounts for firms with 'overpaid' executives are not compensated by market value increases for firms with 'underpaid' executives. Apparently, the negative association of abnormal pay and market returns is driven by firms with presumably overpaid executive board members, which suggests that the regulation imposed costs mainly on firms with an abnormally high level of executive compensation. Shareholders of firms that were explicitly targeted by the regulation expected the regulation to decrease firm value, which suggests that the regulation was not viewed as breaking up inefficient contractual arrangements, but rather the opposite. Although weaker in terms of significance, the positive coefficient for our variable measuring pay-performance sensitivity is consistent with that interpretation, and leads us to reject our third hypothesis (H3). Our subsample analysis for non-financial firms confirms that these effects or market perceptions are not centred on banks only, but appear to represent a rather general, cross-industry phenomenon.

Taken together, our findings demonstrate an economic impact of the regulation, as reflected in significant market reactions both for the announcement-date analysis and for the pooled analysis. While the direction of the economic impact, the change in firm value, varies across firms, we are able to document in particular that the negative market reactions for firms with presumably overpaid managers are not compensated by 'winners' of the regulation, as we are unable to demonstrate gains for firms with underpaid executives. Together with our initial finding that the mean market reaction over all events was not positive, we interpret our findings as evidence that overall, market participants did not regard the regulation as beneficial. Therefore, we need to reject not only our hypotheses, but also the notion that regulation of executive compensation in the German stakeholder environment may force contractual arrangement closer to efficient outcomes from a shareholder-oriented perspective.

We note that our results are supported by various triangulations. First, we are able to demonstrate our main findings both for the first-time exogenous shock and for the pooled sample. Second, we ascertain significance of our results using three different test statistics. However, as noted, we cannot preclude measurement bias for our test variables, in particular for our measure of pay-performance sensitivity. Also, we caution that our findings do not allow for ultimate inferences with respect to the potential usefulness of this particular regulation, given the diverse impact on the firm level. Finally, our

analysis of economic effects is limited to shareholder wealth, and leaves out other constituencies whose welfare might be affected by the regulation.

### 2.5.3  Robustness tests

To assess the robustness of our results, we estimate our models employing several variations in the dependent variables and the test variables. Table 2.8 summarizes the results from these robustness checks, and reports the findings from our main analyses. With respect to our dependent variable, MAR (Table 2.8, Panel A), we alternatively use a five-day event window (-2/+2) instead of a three-day window. Results are similar, with slight variations in the significance levels. Second, we replace our dependent variable MARs with cumulative abnormal returns (CAR), also for the three-day event window (e.g. MacKinlay, 1997). Consistent with our main analyses, we use as a proxy for the market portfolio the FTSE World Europe excluding Germany index. The estimation window comprises 250 trading days prior to the respective events. Again, we find results consistent with our main analyses.

We also use alternative specifications of the two test variables, ABNORMAL PAY and PAY SENSITIVITY. For our main test variable ABNORMAL PAY, our main analyses use a definition consistent with Cai and Walking (2011). For the robustness analysis (Table 2.8, Panel B), we first use an alternative specification similar to Larcker et al. (2011) and define EXCESS PAY as the two-year average of the natural logarithm of average executive compensation less the median of the firm's size tercile of the respective SIC division.[25] Consistent with our main findings this analysis yields that, although negative, the coefficient for EXCESS PAY is not significant for the single-event analysis, but turns out negative and significant at the 1% level in our pooled multi-event analysis. Second, we modify our definition of ABNORMAL PAY by using the number of employees instead of market capitalisation as the proxy variable for SIZE. We find that results remain basically unchanged, although significance levels decrease to 10% (5%) for the single-event (pooled) analysis. Third, we use sales instead of market capitalisation as the proxy variable for SIZE. While the sign of the coefficient estimate remains negative, it slightly misses the significance threshold of 10%, with a p-value of 0.107 (not tabulated). Fourth, we estimate model (1) using CEO compensation data in-

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[25]  Larcker et al. (2011) use a substantially larger sample and subtract from the natural logarithm of CEO compensation the natural logarithm of median annual CEO compensation for all firms in the same industry group and size quintile.

stead of average board member compensation. However, we note that this analysis is subject to heavy selection bias. Roughly one out of five listed firms does not report remuneration details for single board members, thereby applying a legal 'opt-out' clause granted to firms where a majority of 75 % of shareholders supports such non-disclosure. As Hitz and Werner (2012) show, firms that are particularly likely to use this 'opt-out' clause are such firms that pay average 'excess' compensation, that is, compensation above the industry average.[26] Therefore, it comes as no surprise that results for the CEO sample are weaker and the coefficient on ABNORMAL CEO PAY is negative but not significant.

With respect to our second test variable, PAY SENSITIVITY, we use two alternative specifications (Table 2.8, Panel C). First, we use the percentage change in total compensation instead of the percentage change in performance-based compensation components only. Results remain unchanged, but the significance of the coefficient on PAY SENSITIVITY increases to the 5% level in the pooled analysis. Second, we use total cash compensation (i.e. fixed salary and short-term bonuses) instead of performance-based compensation in the numerator. Again, the coefficient on PAY SENSITIVITY in the pooled analysis turns out significantly negative (5% level).

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[26] Similarly, our data show that for firms with positive values for ABNORMAL PAY, and thus presumably overpaid executives, mean ABNORMAL PAY is significantly higher (5% level) for firms not included in this robustness test than for firms for which the relevant CEO compensation data are available.

**Table 2.8:** Summary of original findings and robustness tests

| | Original findings (Table 2.6) | | Robustness tests | | | |
|---|---|---|---|---|---|---|
| *Panel A: Alternative measures of the dependent variable (Market reactions)* | | | | | | |
| Sample | All firms | Non-financials | All firms | Non-financials | All firms | Non-financials |
| Adjusted return definition | | | MAR (5-day) | MAR (5-day) | CAR | CAR |
| ABNORMAL PAY | -0.012 | -0.010 | -0.012 | -0.010 | -0.013 | -0.011 |
| | (-2.73)*** | (-3.08)*** | (-1.95)* | (-1.87)* | (-2.76)*** | (-3.82)*** |
| PAY SENSITIVITY | 0.001 | 0.001 | 0.001 | 0.002 | 0.001 | 0.001 |
| | (1.93)* | (2.17)** | (3.73)*** | (3.62)*** | (1.95)* | (2.05)** |
| *Panel B: Alternative measures of abnormal pay* | | | | | | |
| Sample | All firms | Non-financials | All firms | All firms | Non-financials | All firms without opt-out |
| Executives | All board members | All board members | All board members | All board members | All board members | CEOs |
| Abnormal pay definition | | | EXCESS PAY | ABNORMAL PAY (employees) | ABNORMAL PAY (sales) | ABNORMAL CEO PAY |
| ABNORMAL PAY | -0.012 | -0.010 | -0.009 | -0.008 | -0.004 | -0.005 |
| | (-2.73)*** | (-3.08)*** | (-2.84)*** | (-2.21)** | (-1.61) | (-1.20) |
| PAY SENSITIVITY | 0.001 | 0.001 | 0.000 | 0.001 | 0.001 | 0.001 |
| | (1.93)* | (2.17)** | (1.04) | (2.07)** | (2.26)** | (2.30)** |
| *Panel C: Alternative measures of pay-performance sensitivity* | | | | | | |
| Sample | All firms | Non-financials | All firms | All firms | All firms without opt-out | |
| Executives | All board members | All board members | All board members | All board members | CEOs | |
| Pay sensitivity definition | | | PAY SENSITIVITY (Average total compensation) | PAY SENSITIVITY (Average cash compensation) | CEO PAY SENSITIVITY | |
| ABNORMAL PAY | -0.012 | -0.010 | -0.012 | -0.013 | -0.005 | |
| | (-2.73)*** | (-3.08)*** | (-2.70)*** | (-3.05)*** | (-1.20) | |
| PAY SENSITIVITY | 0.001 | 0.001 | 0.003 | 0.002 | 0.001 | |
| | (1.93)* | (2.17)** | (2.18)** | (2.31)** | (2.30)** | |

Notes: This table reports original findings from our pooled analyses (Table 2.6), and results from various robustness checks, which repeat the original pooled analyses employing alternative specifications of the dependent variable (market reactions), and the two test variables, ABNORMAL PAY and PAY SENSITIVITY. Definitions of variables are reported in Table 2.1. Z-values are reported in parentheses.

***Two-tailed significance at the 1% level from testing whether coefficients are different from zero.

** Two-tailed significance at the 5% level from testing whether coefficients are different from zero.

* Two-tailed significance at the 10% level from testing whether coefficients are different from zero.

## 2.6 Conclusion

This paper exploits a quasi-natural experimental setting, the recent regulation of board executive compensation in Germany, to shed light on how the market perceives the impact of the regulation on firm value. We find that market perceptions, reflected in abnormal returns around the announcement of the regulation and the ensuing events that ultimately led to adoption of the regulation, were mildly negative on average. Detailed analyses shed more light on this market reaction and reveal that firms which were more likely to be affected by the regulation experience reductions in equity market value, in particular firms with high 'abnormal' compensation. This indicates that at least for a subset of firms, market participants regarded the proposed regulation as potentially shaking up efficient compensation contracts.

These findings illustrate how the proposed regulation diversely affects different firms, depending on the nature of compensation contracts in place. On a broader level, our results corroborate and augment prior US evidence of a negative impact of comparable regulation, emphasizing how equity market participants across jurisdictions and institutional environments selectively disapprove of regulating management compensation.

Our findings are subject to limitations. First, while most provisions of the VorstAG regulation pertain to listed and private firms, our findings relate to the former only. As governance mechanisms and ownership structures are distinctively different for private firms, our findings on the impact of the regulation are not generalisable to these firms. Second, our measure of economic impact, firm value, reflects shareholders' welfare only. Therefore, we are unable to give a thorough assessment of the usefulness of the regulation with respect to other stakeholders' welfare. Third, our findings are subject to the quality of our empirical constructs. In particular, as we cannot observe existing contracts in place, we need to rely on observable data on management compensation to identify firms with contracts that may provide for abnormally high remuneration or that may only weakly tie pay to performance.

Overall, this paper's findings underscore how regulation of governance mechanisms potentially affects economic welfare, and that it potentially does so with high variation on the firm level. Moreover, our findings emphasize the need to document and explore economic impacts of regulation in an era of increasing state intervention.

## 2.7 Appendix

*Appendix A: Descriptive statistics for the first-time announcement*

*Panel A: Descriptives*

|  | Mean | Standard deviation | First quartile | Median | Third quartile | N |
|---|---|---|---|---|---|---|
| ABNORMAL PAY | 0.0046 | 0.4258 | -0.2747 | 0.0228 | 0.2664 | 202 |
| PAY SENSITIVITY | -0.3141 | 3.5141 | -0.4065 | 0.0134 | 0.2095 | 202 |
| FREE FLOAT | 0.6049 | 0.2441 | 0.4300 | 0.5800 | 0.8100 | 202 |
| SIZE (in millions) | 5230.92 | 14888.85 | 67.83 | 252.70 | 1632.96 | 202 |
| MTB | 2.6312 | 3.1983 | 1.3044 | 1.9250 | 2.9318 | 202 |
| MOMENTUM | -0.0066 | 0.2284 | -0.1373 | -0.0083 | 0.1172 | 202 |
| DAX | 0.1188 | 0.3244 | 0.0000 | 0.0000 | 0.0000 | 202 |

*Panel B: Correlations*

|  |  | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|---|
| ABNORMAL PAY | (1) | **1.0000** |  |  |  |  |  |  |
| PAY SENSITIVITY | (2) | -0.0425 | **1.0000** |  |  |  |  |  |
| FREE FLOAT | (3) | **0.1211** | -0.0943 | **1.0000** |  |  |  |  |
| SIZE | (4) | 0.0218 | -0.0180 | **0.2746** | **1.0000** |  |  |  |
| MTB | (5) | 0.0216 | -0.0759 | -0.0946 | 0.0129 | **1.0000** |  |  |
| MOMENTUM | (6) | **-0.1646** | **-0.1191** | **-0.1218** | 0.0504 | 0.0112 | **1.0000** |  |
| DAX | (7) | 0.0762 | 0.0124 | **0.2949** | **0.8121** | 0.0133 | 0.0378 | **1.0000** |

Notes: Panel A shows descriptive statistics and Panel B reports Pearson correlations for the variables included in the regressions (values for event No. 1). Definitions of variables are reported in Table 2.1. In Panel A, SIZE is reported without the natural logarithm. In Panel B, bold values indicate two-tailed significance at the 10% level.

*Appendix B: Descriptive statistics for financial firms*

| Panel A: Descriptives | | | | | | |
|---|---|---|---|---|---|---|
| | Mean | Standard deviation | First quartile | Median | Third quartile | N |
| ABNORMAL PAY | 0.0158 | 0.4894 | -0.3406 | 0.0371 | 0.2810 | 158 |
| PAY SENSITIVITY | 0.7679 | 3.6742 | -0.2095 | 0.0809 | 0.3864 | 158 |
| FREE FLOAT | 0.6363 | 0.2641 | 0.3900 | 0.6200 | 0.9000 | 158 |
| SIZE (in millions) | 4493.15 | 10131.59 | 65.40 | 213.23 | 2758.06 | 158 |
| MTB | 1.3965 | 1.8543 | 0.5652 | 0.8109 | 1.2103 | 158 |
| MOMENTUM | 0.0094 | 0.2854 | -0.1410 | -0.0353 | 0.1664 | 158 |
| DAX | 0.2152 | 0.4123 | 0.0000 | 0.0000 | 0.0000 | 158 |

| Panel B: Correlations | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| ABNORMAL PAY | (1) | **1.0000** | | | | | | |
| PAY SENSITIVITY | (2) | -0.0647 | **1.0000** | | | | | |
| FREE FLOAT | (3) | 0.0417 | **0.2311** | **1.0000** | | | | |
| SIZE | (4) | 0.1222 | 0.0956 | **0.4890** | **1.0000** | | | |
| MTB | (5) | **-0.2104** | **0.1994** | 0.1274 | 0.0707 | **1.0000** | | |
| MOMENTUM | (6) | **-0.1828** | -0.0424 | **0.2321** | 0.0390 | 0.0419 | **1.0000** | |
| DAX | (7) | 0.0553 | 0.1075 | **0.4877** | **0.7644** | 0.0970 | 0.0669 | **1.0000** |

Notes: Panel A shows descriptive statistics and Panel B reports Pearson correlations for the variables included in the regressions (values for all seven events) for financials only. Definitions of variables are reported in Table 2.1. In Panel A, SIZE is reported without the natural logarithm. In Panel B, bold values indicate two-tailed significance at the 10% level.

## 3 Investor Perceptions of Opting Out of the EU-Regulated Equity Market

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**Abstract:** This paper exploits an exogenous shock to the requirements for opting out of the EU-regulated equity market in Germany to investigate investor perceptions of being able to downlist from the highly regulated EU-regulated market to the weakly regulated exchange-regulated market. I examine whether investors value the bonding to the high level of disclosure in the EU-regulated market or whether they welcome firms being able to leave the costly EU-regulated market, as proposed under the loss of competitiveness theory. Using event study methodology, I measure market reactions and determinants of market reactions around four (six) events that lead to reductions (increases) in the requirements for opting out of the EU-regulated market in Germany. While reductions in opt out requirements seem to matter to investors, as reflected in abnormally high trading volume around the respective events, subsequent increases in the requirements do not. My findings on price reactions are mainly indicative of cost considerations that are shared by investors. Investors of firms which are considered to be more likely to opt out due to high ownership concentration, erroneous financial statements, and financial distress welcome the reduced regulation. However, in some cases, findings can also be aligned with bonding theory. Finally, negative price reactions for firms that downlist under the reduced regulation indicate that investors might have anticipated compensation in exchange for their shares, which was no longer possible under the revised regulation.

*JEL Classification:* M 48.

*Keywords:* Regulation, downlisting, disclosure, bonding theory, loss of competitiveness theory.

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## 3.1 Introduction

This paper exploits an exogenous shock to requirements for opting out of the EU-regulated market to investigate equity investors' perceptions of such an opt out. I investigate whether investors value the bonding to the high level of disclosure and enforcement in the EU-regulated market or whether they welcome firms being able to leave the costly EU-regulated market, as proposed under the loss of competitiveness theory. A firm's commitment to strict reporting and disclosure requirements reduces information asymmetry, increases liquidity, and lowers costs of capital (e.g., Botosan, 1997; Leuz and Verrecchia, 2000). Bonding theory suggests that monitoring imposed on firms by committing to a stricter listing regime that is hard to dispense with increases firm value (Coffee, 1999; Stulz, 1999; Coffee, 2002). By voluntarily subjecting themselves to higher disclosure requirements and a higher level of enforcement, issuers reduce information asymmetries between managers, or majority shareholders, and minority shareholders. Consequently, committing to a stricter listing regime increases minority investor protection. As this commitment is costly, it may function as a signal of positive future prospects of a firm (e.g., Mittoo, 1992).

A firm's listing choice is driven by trading off costs (e.g., direct costs of the listing, indirect costs that result from mandatory reporting requirements, and voluntary disclosure expected by investors) and benefits (e.g., capital raising opportunities, lower information asymmetry, and hence higher liquidity) of the listing status (Bharath and Dittmar, 2010; Chaplinsky and Ramchand, 2012). Since firms continuously evaluate the costs and benefits of their listing status, a shift in these related costs or benefits can lead to a revision in a firm's listing choice. The loss of competitiveness theory suggests that a firm's decision to discontinue its listing under a stricter listing regime is likely driven by an increase in compliance costs that leads to an unfavorable cost-benefit tradeoff (Zingales, 2007). However, if a firm faces an unfavorable cost-benefit tradeoff regarding the listing per se, but costs associated with opting out of the listing regime are prohibitively high, the firm may choose to remain within the current listing regime. Thus, a reduction in the requirements for opting out of the listing regime may lead to a revision in the firm's listing choice.

My non-exclusive predictions on investor perceptions of changes in requirements for opting out of the EU-regulated market follow loss of competitiveness and bonding theory, respectively. If the costs of the listing exceed its benefits, as proposed under the loss

of competitiveness theory, but opting out is too costly for reasons of high requirements, I expect that investors welcome (penalize) reduced (increased) requirements for opting out of the EU-regulated market. In contrast, if investors value the bonding to the EU-regulated market, I expect that investors penalize (welcome) reduced (increased) requirements for opting out of the EU-regulated market. I expect that market reactions are more pronounced for firms that are more likely to consider opting out of the EU-regulated market due to high compliance costs, low financing needs, low liquidity, more concentrated ownership, and low commitment to increased disclosure.

Until recently, German firms were hardly able to "regularly"[3] opt out of the EU-regulated market, that is, to downlist from the EU-regulated market to the exchange-regulated market. The so-called 'Macrotron' principles, effective since 2002, required firms to provide a majority vote by the shareholders' meeting and an offer to buy shares from minority shareholders in order to downlist or to delist. In contrast to the EU-regulated market that specifies extensive disclosure requirements mandated in particular by the European Union, firms listed in the exchange-regulated market are only subject to regulation imposed by the respective stock exchange. In 2012, following several regional court rulings, the German Federal Constitutional Court agreed that the 'Macrotron' principles were not applicable to downlistings to the exchange-regulated market. As a result, in 2013, the 'Macrotron' principles were revoked. These reduced opt out requirements led to a sharp increase in the number of downlistings. Until 2014, 93 firms had moved to the exchange-regulated market (Pasch et al., 2015). As this development was criticized as harming minority shareholders (e.g., FAZ, 2014), the German legislator started to address the regulation of opt outs in early 2015. Following a relatively short regulatory process, the German Parliament passed a revised regulation on October 1, 2015 mandating firms to offer to shareholders compensation based on the average stock price over the past six months in case of downlistings and delistings.

This German setting allows me to investigate whether investors welcome the reduced requirements for opting out of the costly EU-regulated market or whether investors value the bonding to the strict disclosure requirements. Also, it enables me to examine whether this notion is still shared by investors when requirements for opting out are increased subsequently. I identify four (six) events leading to the gradual decrease (in-

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[3]    Firms that opt out "regularly" are firms whose opt out is not attributable to bankruptcy, mergers, or acquisitions.

crease) in opt out requirements from January 2012 to November 2013 (March to October 2015). For a sample of 2991 firm-event observations of German firms listed at FSE (Frankfurt Stock Exchange), I measure three-day market adjusted returns and abnormal trading volume. Using OLS-regression, I estimate determinants of pooled price reactions for events leading to reductions (increases) in opt out requirements.

Unlike prior U.S. findings that indicate that investors of cross-listed firms value the bonding to high disclosure requirements in the U.S. (Doidge et al., 2010; Fernandes et al., 2010), my findings are mainly indicative of cost considerations that are shared by investors, as proposed under the loss of competitiveness theory. I find evidence of a weakly positive price reaction to reductions in opt out requirements. While reductions in opt out requirements seem to have an impact on expectations of investors, as reflected in abnormally high trading volume, increases in the requirements for opting out do not. Similarly, results on price reactions to increases in opt out requirements are mostly insignificant. Consequently, findings mostly relate to events leading to reduced opt out requirements. My findings on the determinants of price reactions suggest that for firms with high ownership concentration, and for firms previously censured under the German enforcement regime, the costs of the listing seem to outweigh the benefits, and being able to opt out might be beneficial from an investor perspective. Results on firms that have been previously censured under the enforcement regime are confirmed when opt out requirements are hitherto increased as investors of these firms react negatively to the regulation. Also in line with the loss of competitiveness theory, investors of financially distressed, leveraged firms seem to welcome the reduced requirements for leaving the costly EU-regulated market. However, findings on leveraged firms can also be reconciled with the bonding hypothesis. Monitoring by banks can be interpreted as an alternative monitoring mechanism that makes bonding to the EU-regulated market redundant. In line with this notion, investors of less leveraged firms react less positively to reduced opt out requirements. Also in line with bonding theory, firms that opt out subsequently exhibit significantly negative price reactions to reductions in opt out requirements. This finding might indicate that investors in fact value the bonding to stricter disclosure and reporting requirements in the EU-regulated market. However, it is also possible that this price reaction is attributable to the fact that investors had anticipated compensation. In many cases, investors already knew that the firm was intending to downlist. Prior to the reduced regulation, investors of downlisting firms were able to hope for compensation as required under the 'Macrotron' principles. If investors had anticipated compensation

that was no longer required under the revised regulation, these investors would have incurred wealth decreases. The weak findings on increases in opt out requirements might be attributable to the fact that revised requirements could have been stricter, or to the fact that firms eligible to opting out had already done so under the reduced regulation.

Overall, this paper's findings extend prior U.S. evidence as they show that, in some cases, investors seem to welcome being able to opt out of the EU-regulated market, as proposed under the loss of competitiveness theory. In the German continental European setting, in contrast to the U.S. cross-listing setting, firms that opt out remain within the same jurisdiction. Therefore, investors do not need to fear that they will be less informed due to an increased regional distance to the stock exchange location. Also, visibility to competitors or customers in another jurisdiction does not need to be taken into consideration by investors. This paper cautions that, in the German continental European setting, the negative cost-benefit tradeoff seems to occasionally outweigh the bonding to stricter disclosure requirements in the EU-regulated market. Consequently, U.S. findings on changes in opt out requirements do not necessarily translate to the continental European environment, where a substantial number of firms has recently opted out of increased disclosure requirements (Fiechter et al., 2016; Pasch et al., 2015). Findings should also be of interest to regulators, who argued that higher opt out requirements increase investor protection (Deutscher Bundestag, 2015). However, weak trading volume reactions around events related to increases in opt out requirements indicate that the regulation did not matter much to investors.

The remainder of the paper is as follows. In section 3.2, I outline the institutional background in Germany. Section 3.3 summarizes the theoretical background, related literature, and develops my predictions. The research design of the paper is outlined in section 3.4 and results are presented and discussed in section 3.5. Section 3.6 concludes.

## 3.2    Institutional background

### *3.2.1    Disclosure requirements of market segments at FSE*

I examine firms listed at Frankfurt Stock Exchange (FSE), the most prominent German stock exchange, which comprises most German listed firms.[4] FSE offers two types of capital market access: the EU-regulated market and the exchange-regulated market (open market). Firms that "regularly" opt out of the EU-regulated market of FSE usually downlist to the exchange-regulated market at FSE (Pasch et al., 2015).[5] Disclosure requirements between the EU-regulated market and the exchange-regulated market differ substantially. In order to emphasize the impact of opting out of the EU-regulated market on the level of disclosure, this section summarizes disclosure requirements of firms listed in the EU-regulated and exchange-regulated market of FSE, respectively. A detailed overview of the reporting requirements at FSE during the period of interest is given by Hitz and Müller-Bloch (2016).

Firms listed in EU-regulated market segments are subject to mandatory IFRS reporting for consolidated financial accounts (sec. 315 Commercial Code (CC)) and enforcement of accounting standards by FREP and BaFin (sec. 342b CC, sec. 37n-37u Securities Trading Act (STA)). These firms have to prepare annual financial reports within four months after fiscal year end (sec. 37v, 37y STA) and semi-annual financial reports within two months after the end of the second quarter (sec. 37w, 37y STA). FSE not only offers the regular EU-regulated market, the General Standard, but also a premium segment, the Prime Standard.[6] According to FSE (2016a), the Prime Standard segment aims at firms that intend to target also international investors. During the period of interest, firms listed in the General Standard segment had to publish interim announcements around the end of the first and third quarter (sec. 37x STA, old version), while firms listed in the Prime Standard had to prepare interim financial reports within two months after the end of the first and third quarter (§ 51 Stock Exchange Rules (SER),

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[4]    As of July 2015, out of 686 firms listed in the German EU-regulated market with equity or debt instruments, 473 firms were listed at FSE with equity instruments.

[5]    Pasch et al. (2015) also give an overview of other regional stock exchanges in Germany.

[6]    Sec. 42 of the Stock Exchange Act (SEA) explicitly introduces the possibility for stock exchanges to establish sub-segments of the EU-regulated market with additional post-admission obligations. Based on this rule, the FSE not only offers the regular EU-regulated market, the General Standard, but also a premium segment, the Prime Standard.

old version).[7] Apart from financial reports, firms listed in EU-regulated market segments have to fulfil additional disclosure requirements, such as ad hoc announcements (sec. 15 STA) and director's dealings (sec. 15a STA).

The exchange-regulated market of FSE comprises the Entry Standard segment.[8] The Entry Standard segment was established to ease capital market access for small and medium sized firms (FSE, 2016b). Firms listed in the Entry Standard have to prepare financial statements (consolidated financial statements) and a management report according to German GAAP (sec. 264, 290 CC). The General Terms and Conditions of the Open Market (GTC) mandate them to publish an audited financial statement and the management report within six months after fiscal year end (sec. 19 GTC), and to prepare semi-annual financial statements within three months after the end of the second quarter (sec. 19 GTC). In addition, during the period of interest, firms listed in the Entry Standard segment had to publish important information regarding securities and the issuers ("quasi ad hoc announcements") (sec. 19 GTC).[9]

### 3.2.2 Regulation of requirements for opting out of the EU-regulated market and identification of events

This paper exploits an exogenous shock to the requirements for opting out of the EU-regulated market, namely the decrease in opt out requirements in 2012 and 2013 due to court rulings, and the subsequent increase in opt out requirements in 2015 due to a revision in the regulation. As these events exogenously altered the costs associated with opting out, these regulatory changes in Germany present an interesting setting to investigate whether investors value the bonding to the EU-regulated market or whether investor perceptions rather follow cost considerations.

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[7]   As of November 2015, firms listed in the General Standard are no longer required to publish interim announcements, whereas firms listed in the Prime Standard are no longer required to publish interim financial reports, but have to publish interim announcements instead (sec. 51a SER).

[8]   Sec. 48 SEA enables stock exchanges to introduce exchange-regulated market segments with additional post-admission obligations within the open market, as long as these additional obligations do not apply to issuers that are included in the exchange-regulated market without the issuers consent. Consequently, the FSE offers a qualified exchange-regulated market segment with additional post-admission obligations, the Entry Standard, in which stocks are only included on request of the issuer according to sec. 16 GTC. Apart from the Entry Standard, the FSE also offers an open market segment for stocks that are also listed at other 'qualified' stock exchanges, the Quotation Board, in which stocks can be included without the issuer's consent (sec. 10 GTC).

[9]   As of July 2016, firms listed in exchange-regulated market segments are subject to sec. 17 and 19 of the market abuse regulation (Regulation (EU) No. 596/2014 (MAR)) (sec. 39 MAR). As a result, these firms are now mandated to publish ad hoc announcements and director's dealings.

Until 2015, opting out of the EU-regulated market was possible, on the premise that investors were not harmed, consistent with investor protection (sec. 39 SEA). In 2002, this led to the so-called 'Macrotron' ruling, which established that delisting was conditional on a majority vote of the shareholders' meeting and an offer to buy shares from minority shareholders. This offer had to be based on a valuation of the firm with the current stock price serving as the minimum firm value. In the 'Macrotron' ruling, the German Federal Court of Justice stated that liquidity and additional listing obligations in the open market were not comparable to those in the EU-regulated market. Therefore, the 'Macrotron' principles were also applicable to downlistings. Consequently, since downlisting was costly under the 'Macrotron' principles, and costs were somewhat unpredictable, opting out of the EU-regulated market was effectively impossible (e.g., Holzborn and Hilpert, 2010).[10]

On January 10, 2012, an oral hearing on downlistings and delistings took place at the German Federal Constitutional Court (event No. 1).[11] In this hearing, judges voiced doubts that downlistings lead to economic losses for investors. On July 11, 2012, the German Federal Constitutional Court ruled that the 'Macrotron' principles were not applicable to downlistings to exchange-regulated market segments (event No. 2) and it was up to the German Federal Court of Justice to potentially revoke the 'Macrotron' principles. The German Federal Court of Justice revoked these principles on October 8, 2013 (event No. 3), which was also published in a press release on November 12, 2013 (event No. 4). Effectively, all German firms were now able to opt out of the EU-regulated market upon decision of the executive directors.

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[10]　From 2007 on, this regulation started to dissolve. In July 2007 and May 2008, regional courts in Munich ruled that the 'Macrotron' principles were not applicable to downlistings to the exchange-regulated market. In similar rulings in June 2008 and April 2009 by regional courts in Berlin, the courts followed the rulings from Munich. Consequently, from April 2009 on, firms were effectively able to downlist without facing the costs imposed by the 'Macrotron' principles (Hitz and Müller-Bloch, 2016). In a semi-strong efficient market, information is immediately incorporated into prices, when it is publicly available. Nevertheless, since there were no press releases published in the course of these court decisions, it is not possible to determine, when these events became publicly available information. Therefore, they are not included in my analysis.

[11]　I identify events that changed the extent or likelihood of the regulation of delisting and downlisting requirements. Since requirements were altered by court decisions as well as regulatory action, I first search legislative announcements and press releases by German regulators and press releases on court rulings dealing with delisting or downlisting requirements. Secondly, I perform a media analysis using the LexisNexis database and the print versions of 'Frankfurter Allgemeine Zeitung (FAZ)' and 'Handelsblatt' to identify potential events not identified in the first analysis, and to ensure that the events were covered by the media and, thus, information on these events was publicly available.

**Table 3.1:**     Events leading to changes in opt out requirements

| Event | Date | Type | Content | Impact on level of regulation |
|---|---|---|---|---|
| 1 | Jan 10, 2012 | Oral hearing (German Federal Constitutional Court) | Results of the court proceedings is unclear but judges doubt that downlistings lead to economic losses for investors | - |
| 2 | July 11, 2012 | Court decision (German Federal Constitutional Court) | Previous requirements for delistings are no longer applicable to downlistings. German Federal Court of Justice is asked to consider revoking previous delisting requirements | - |
| 3 | Oct 8, 2013 | Court decision (German Federal Court of Justice) | Court decision to revoke previous delisting requirements | - |
| 4 | Nov 12, 2013 | Press release (German Federal Court of Justice) | Press release on court decision of Oct 8, 2013 | - |
| 5 | Mar 6, 2015 | Response to draft law (German Federal Council) | German Federal Council asks German Parliament to consider stricter requirements for delistings to protect minority shareholders | + |
| 6 | May 6, 2015 | Press release (CDU/CSU) | Expert hearing in the legal committee of the German Parliament: The German Parliament is supposed to deal with delisting requirements shortly | + |
| 7 | May 28, 2015 | Press release (SPD) | Expert hearing: Experts agree that minority shareholders need to be compensated in case of a delisting | + |
| 8 | Sept 7, 2015 | Parliament hearing | Expert hearing: Compensation depending on average prices over the past three months is considered | + |
| 9 | Sept 24, 2015 | Press release (SPD) | Coalition agrees on increasing period for average prices to sixth months and stricter delisting requirements will be introduced in a week's time | + |
| 10 | Sept 30, 2015 | Parliament passage | Passage of the law in the German Parliament | + |

This table summarizes events identified that led to changes in opt out requirements.

This regulation was criticized as harming minority shareholders from the beginning (e.g., FAZ, 2014) and German policy makers consequently started to consider to regulate opting out of the EU-regulated market in order to protect minority shareholders (e.g., Bayer and Hoffmann, 2015; FAZ, 2015a). On March 6, 2015, the German Federal Council asked the German Parliament to consider stronger regulation of opt outs to protect minority investors (event No. 5). On May 6, 2015, the conservatives issued a press release stating that the German Parliament was supposed to deal with compensation for minority shareholders in case of opt outs shortly (event No. 6). On May 28, 2015, the social democrats issued a press release noting that experts had agreed that compensation for minority shareholders was necessary (event No. 7). In a parliament hearing on September 7, 2015, compensation based on average stock prices over the past three months prior to announcing the intent to opt out was considered (event No. 8). Since the three months period was criticized by investor protection institutions, a press release issued by the social democrats on September 24, 2009 stated that the period would be increased to six months (event No. 9). On September 30, 2015, the final version of the law was published and it was passed in the German Parliament on October 1, 2015. I include September 30, 2015 as the final event, since the governing parties and the media already noted on September 30, 2015 that the level of regulation had been increased (event No. 10). Effective retroactively to September 7, 2015, the executive board is still able to revoke a firm's listing if investor protection is maintained. However, the withdrawal is only legitimate if compensation is offered to investors. This compensation needs to be at least the average weighted domestic share price over the past six months.[12] A majority vote by the shareholders meeting is not required. Table 3.1 summarizes all events leading to changes in the level of the regulation of opt out requirements.

## 3.3 Theoretical background, related literature, and predictions

### 3.3.1 Theoretical background of listing decisions

This paper focuses on firms that downlist, that is, firms that continue to be publicly traded but switch to a less liquid market with reduced reporting and compliance requirements. Consequently, this paper is most closely related to the literature on cross-(de)listings and voluntary (non-)disclosure. Prior literature suggests that a firm's com-

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[12]   In case of previous market abuse, the assessment has to be based on an income capitalization approach.

mitment to strict reporting and disclosure requirements reduces information asymmetry, increases liquidity, and lowers costs of capital (e.g., Botosan, 1997; Leuz and Verrecchia, 2000). Lambert et al. (2007) provide a theoretical framework that demonstrates that the quality of accounting information affects cost of capital. Balakrishnan et al. (2014) show empirically that increased disclosure improves liquidity, and thus increases firm value. Bharath and Dittmar (2010) outline that a firm's listing choice is based on information considerations, access to capital, control, liquidity, and agency considerations. Cross-listing can lead to more frequent trading of stocks, in particular, if liquidity in the domestic market is relatively low (e.g., Bancel and Mittoo, 2001; Mittoo, 1992; Pagano et al., 2002). According to Pagano et al. (2002), reasons for cross-listing include raising capital, liquidity, a positive cost-benefit tradeoff, and a commitment to disclosure and governance standards, also referred to as signaling or bonding theory (e.g., Coffee, 1999; Coffee, 2002; Mittoo, 1992; Stulz, 1999). The ensuing sections outline two complimentary theories relating to the economic impact of reducing listing requirements.

### 3.3.1.1    Bonding theory

In attempting to raise capital, managers, or majority shareholders,[13] have to convince potential (minority) shareholders that they will receive higher cash flows from investing in the firm than from investing in an alternative investment with the same risk. Difficulties in convincing potential shareholders stem from the information asymmetry between managers, or majority shareholders, and potential (minority) shareholders about the firm's investments, and from the fact that managers might also engage in projects that do not increase (minority) shareholder welfare (Stulz, 1999). These problems can be mitigated by increased monitoring, which can, among other things, result from the legal system, for example, listing regimes with strong protection of (minority) shareholders, and from increased disclosure required by the listing regime (Stulz, 1999). Bonding theory suggests that listing under a stricter listing regime increases firm value, because, by voluntarily subjecting themselves to higher disclosure requirements and a higher level of enforcement, issuers compensate for weak protection of minority shareholders (Coffee, 2002). As committing to a stricter listing regime is costly, it may be regarded as a signal of positive future prospects of a firm (e.g., Mittoo, 1992). Such a listing re-

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[13]    Note that the presence of large shareholders can also lead to increased monitoring of managers.

gime could be characterized either by a stricter regulatory environment or by an exchange with stricter disclosure requirements.

Primarily, bonding theory is applied to cross-listings, that is, firms that remain listed at their domestic market and cross-list in the U.S. Empirically, Doidge et al. (2004) find that cross-listing firms have a higher valuation than single-listed firms and that controlling shareholders have only incentives to cross-list if they want to raise capital. Doidge et al. (2009) find that firms that have controlling shareholders, and firms that are controlled by managers or their families, are less likely to cross-list, since U.S. securities law and enforcement seems to constraint the controlling shareholders' ability to extract private benefits. In my downlisting setting, bonding relates to the commitment to an increased disclosure and enforcement regime that results from being listed in the EU-regulated market instead of the exchange-regulated market.

### 3.3.1.2   *Loss of competitiveness theory*

Costs associated with being committed to a stricter listing regime are the direct costs of the listing (e.g., Mittoo, 1992) as well as indirect costs that result from increased financial disclosure such as mandated accounting, listing and regulatory requirements, and voluntary disclosures expected by market participants (Biddle and Saudagaran, 1989). From a theoretical perspective, firms will opt out of a listing regime if the costs of the listing outweigh the benefits (Bharath and Dittmar, 2010; Chaplinsky and Ramchand, 2012). Since firms continuously evaluate the costs and benefits of their listing status, a shift in the costs or benefits of the listing status can lead to a revision in a firm's listing choice. The loss of competitiveness theory suggests that a firm's decision to discontinue its listing in a stricter listing regime, for example the U.S., is likely driven by increases in compliance costs that lead to an unfavorable cost-benefit tradeoff (Zingales, 2007). A similar argument applies to changes associated with the barriers for opting out of the current listing regime. If the costs of the listing exceed the benefits, but costs associated with opting out of the listing regime are prohibitively high, the firm might choose to remain within the current regime. Correspondingly, if the costs for opting out of the listing regime are reduced, the firm might use the opportunity and leave the current regime, and thus increase firm value.

*3.3.2 Related literature*

This paper relates most closely to the body of literature on market reactions to changes in requirements for opting out of specific listing requirements. Prior literature focuses on the introduction of Rule 12h-6, that allows cross-listed firms to deregister from the SEC, and thus to opt out of extensive disclosure requirements. Fernandes et al. (2010) investigate market reactions to the introduction of Rule 12h-6 and find an overall negative response to the introduction of Rule 12h-6 for firms cross-listed in the U.S. This reaction is particularly pronounced for firms that would be subject to weak disclosure requirements post deregistration from the SEC, since legal protection in the country of origin and disclosure requirements at the domestic exchange are low. The market reaction is insignificant for firms that would be subject to a high level of legal protection and disclosure requirements post deregistration. Consequently, findings support bonding theory, since investors of firms from weaker listing regimes value the cross-listing in the U.S. With respect to firm characteristics, the market reaction is incrementally more negative for larger firms, firms with high foreign sales, and firms with high inside ownership. The latter finding suggests that investors of firms with controlling shareholders value the bonding to the U.S. disclosure and enforcement regime. Apart from determinants of cross-delisting decisions and market reactions to cross-delisting announcements, Doidge et al. (2010) examine market reaction to the passage of Rule 12h-6 for a sample of firms that subsequently deregistered under the new rule. They document no significant overall market reaction. In line with Fernandes et al. (2010), the market reaction is significantly negative for firms with high agency costs, for example, firms with high ownership concentration, which suggests that bonding is beneficial for these firms from a (minority) shareholder perspective. Market reactions do not depend on firm characteristics that explain a firm's decision to deregister from the SEC. For a sample of German firms cross-listed at U.S. stock exchanges, Bessler et al. (2012) find a significantly positive market reaction to the introduction of Rule 12h-6, with 15 (two) firms exhibiting positive (negative) market reactions. This finding might suggest that for the majority of German cross-listed firms, being able to opt out of the U.S. listing is valued by investors, which would be in line with the loss of competitiveness theory.

The contribution of this paper is threefold. First, this paper contributes to the literature on market reactions to changes in opt out requirements, as the setting allows me to investigate firms that will remain within the same jurisdiction after opting out. This re-

stricts motives for listing under a stricter listing regime to financing, liquidity, and bonding considerations. Regional motives for listing under a stricter listing regime, such as visibility to customers or competitors in the U.S. or growth of sales in the U.S. (Mittoo, 1992; Pagano et al., 2002), do not need to be taken into consideration by investors when evaluating changes in opt out requirements. Similarly, investors do not need to fear that they will be less informed due to an increased regional distance to the stock exchange location. Second, in the past few years, an increasing number of firms has decided to opt out of stricter disclosure regimes in continental Europe (Fiechter et al., 2016; Pasch et al., 2015). Still, evidence on investor perceptions of changes in opt out requirements is limited to the U.S. cross-listing setting. Prior U.S. evidence indicates that while most investors perceive reduced opt out requirements as value decreasing (Doidge et al., 2010; Fernandes et al., 2010), investors of German firms do not (Bessler et al., 2012). Thus, it is of interest, in particular to regulators in the European Union, whether prior U.S. findings translate to the German continental European setting. At last, this paper extends prior U.S. evidence on the introduction of Rule 12h-6 as it not only investigates reductions in opt out requirements but also investor perceptions of subsequent increases in opt out requirements.

### 3.3.3 Development of empirical predictions

The literature proposes two complimentary lines of thought on investors' perceptions of opting out of a stricter disclosure and enforcement regime that stem from the cost-benefit tradeoff of the listing status (loss of competitiveness theory) and bonding theory. If a firm's decision to downlist results from a rational cost-benefit tradeoff from a (minority) shareholder perspective, (minority) shareholders should welcome the value-enhancing decision to downlist. In contrast, higher agency costs associated with a listing in a less regulated segment might lead to negative stock price reactions (Leuz et al., 2008). In a similar fashion, Doidge et al (2010) predict that under the loss of competitiveness theory, firm that deregister to save listing costs experience a positive market reaction to the passage of Rule 12h-6. Under the bonding theory, in case of firms with greater potential for agency conflicts post deregistration, (minority) shareholders are expected to react negatively to the passage of Rule 12h-6. This line of thought can also be applied to the changes in the requirements for opting out of the EU-regulated market. Although market reactions to German firms' announcements to downlist are, on average, significantly negative, almost half of the firms experience a positive market reac-

tion (Hitz and Müller-Bloch, 2016). This pattern suggests that, for some firms, opting out of the EU-regulated market is perceived to be beneficial by investors, while it is costly for other firms. Building on the cost-benefit tradeoff or loss of competitiveness and the bonding rationale, I expect investors to welcome the possibility to opt out of EU-regulated market if the costs of the listing exceed the benefits of the listing, but opting out was too costly pre deregulation. In contrast, if investors value the firm's bonding to the stricter disclosure requirements and enforcement in the EU-regulated market, and perhaps fear that the firm might opt out due to managerial discretion, I expect a negative market reaction to the deregulation. Vice versa, if barriers for opting out of the EU-regulated market are increased, bonding theory proposes that the regulation is greeted by investors if they value the bonding to the requirements of the EU-regulated market. If firms face an unfavorable cost-benefit tradeoff, investors are expected to react negatively to increased barriers for opting out of the EU-regulated market.

Prior evidence suggests that a firm's likelihood to opt out of a stricter listing regime varies among firm characteristics. Consequently, changes in the requirements for opting out of the EU-regulated market most likely do not affect all firms listed in the EU-regulated market similarly. I differentiate firm characteristics that relate to a firm's cost-benefit tradeoff of the listing status and firm characteristics that relate to a firm's bonding to the current listing regime. Larger firms have higher needs to raise capital and incremental costs of the listing in a stricter listing regime are relatively low (Bancel and Mittoo, 2001; Pagana et al., 2002). The benefit of being listed at a more liquid exchange increases with a firm's level of liquidity (Bancel and Mittoo, 2001; Chaplinsky and Ramchand, 2012). In line with theoretical considerations, evidence by Hitz and Müller-Bloch (2016) suggests that firms are more likely to downlist when compliance costs are relatively high and transparency benefits are relatively low. Similarly, Doidge et al. (2010) document that cross-delisting firms are relatively small and have lower sales growth. Leuz et al. (2008) find that firms that deregister from the SEC are relatively small, weak performing, and highly leveraged with low growth prospects. High leverage can indicate financial distress (e.g., Bechmann and Hjortshoj, 2009; Brealey et al., 2014), which makes incremental costs of the listing more burdensome. Marosi and Massoud (2008) provide evidence that costs imposed by Sarbanes-Oxley Act (SOX) have reduced benefits of cross-listing for smaller and less liquid firms. Consequently, I expect that firms with high *Compliance costs*, low *Financing needs*, and low *Liquidity*

are more affected by the changes in requirements for opting out of the EU-regulated market.

Bonding to a stricter disclosure regime is particularly valuable for investors of firms with high inside ownership and less dispersed ownership (Doidge et al., 2010; Fernandes et al., 2010). However, stricter listing regimes are also more costly for firms with stronger insider control (Marosi and Massoud, 2008). In line with this argument, evidence on the ownership structure across market segments of FSE reveals that ownership is more dispersed in the EU-regulated market, while firms with high individual holdings are most likely listed in the exchange-regulated market.[14] In line with these considerations, I expect that firms are more affected by the regulation when ownership dispersion is low and individual ownership is high (*Ownership structure*). Firms that have voluntarily committed to reporting more than required by the listing regime, e.g., by being listed in the Prime Standard segment or by voluntarily reporting under IFRS prior to 2005, are less likely to be affected by the regulation. In contrast, firms that did not fulfill reporting requirements by the listing regime in the past, for example, by reporting after the legal deadline or publishing erroneous financial statements, are more likely to be affected by the regulation as they show a low level of commitment (*Commitment*). This is in line with evidence by Hitz and Müller-Bloch (2016), who document that firms are significantly more likely to downlist, when they have been censured under the enforcement regime in the past fiscal year. At last, firms that downlist subsequently under the reduced requirements are affected by the regulation, either because opt out requirements are reduced unexpectedly or because managers or majority shareholders decide to downlist in the light of the reduced regulation.

## 3.4    Research design

### 3.4.1    *Measurement of market reactions to the (proposed) regulation*

To test my predictions, I measure market adjusted returns (*CMARs*) around ten events that significantly altered the requirements for opting out of the EU-regulated market. I

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[14]    Ownership structure across market segments at FSE as of June 10, 2016 is summarized in Appendix A. The percentage of free floating shares is significantly higher for firms listed in the EU-regulated market, whereas firms listed in the exchange-regulated market are significantly more often owned by natural persons, in particular family members. This pattern also applies to firms that were initially listed in the EU-regulated market and downlisted to the exchange-regulated market, but is less pronounced when comparing General Standard and Entry Standard firms. In particular, firms that downlisted previously barely differ from those listed in the General Standard.

choose a three-day window around the respective events, which is in line with prior literature (e.g., Armstrong et al., 2010; Fernandes et al., 2010; Joos and Leung, 2013). Further, the choice of a three-day event window is underpinned by the fact that most press coverage occurs the day after the event (see section 3.2.2). *CMARs* are measured as the difference between three-day raw returns for the respective firm and three-day market returns. I estimate market adjusted returns relative to the FTSE World Europe index excluding German firms, since German firms are affected by the regulation and, consequently, including German firms in the benchmark index would bias market adjusted returns, leading me to underestimate the effect of the regulation (Zhang, 2007). In order to examine whether firms are affected by the regulation, I also measure cumulative abnormal trading volume (*CAVol*) around the ten events of interest (Bamber, 1987). Reactions in trading volume are likely to be high relative to price reactions when perceptions among investors differ with respect to the consequences of the event (Bamber and Cheon, 1995). *CAVol* is measured as the sum of the difference between the daily relative trading volume, that is, the number of shares traded less the number of free floating shares outstanding, less the median relative trading volume estimated over a 250 trading day window prior to the respective event.[15]

I measure the mean market reaction for each of the ten events that lead to changes in requirements for opting out of the EU-regulated market (see section 3.2.2). Similar to Armstrong et al. (2010), Joos and Leung (2013), and Larcker et al. (2011), I also measure pooled market reactions. I measure mean market reactions for all four (six) events found to reduce (increase) requirements for opting out of the EU-regulated market. Apart from traditional test statistics, I also estimate market reactions absent regulatory action using Monte-Carlo simulation (Armstrong et al., 2010; Zhang, 2007). Using traditional test statistics, the underlying assumption is that mean market reactions are zero absent regulatory action. If market reactions absent regulatory action differ from zero, results might be attributable to misspecification. For the Monte-Carlo simulation, I randomly select four (six) non-overlapping three-day non-event windows during the period from event No. 1 to event No. 4 (event No. 5 to event No. 10) and calculate pooled market reaction over these non-event windows. I repeat this procedure 1000 times to simulate the distribution of pooled market reactions across randomly selected non-event

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[15] Since the data on trading volume available in Datastream is incomplete, I require data to be available on at least 75% of trading days during the 250 trading day window. Nevertheless, the sample for the analysis of *CAVol* only compromises 56.5% of the final sample.

windows. As an additional test statistic, I then calculate the bootstrap p-value, i.e., the percentage of pooled simulated market reactions that are higher (lower) than pooled market reactions around the event windows of interest if the pooled market reactions are positive (negative).

### 3.4.2 Determinants model

To test my predictions, I estimate the following model using OLS-regression and regress *CMAR* on variables that capture whether a firm is presumably affected by the regulation:

(1)     $CMAR_{it} = \sum Compliance\ costs_{it} + \sum Financing\ needs_{it} + \sum Liquidity_{it} + \sum Owner-$

$ship\ concentration_{it} + \sum Commitment_{it} + Momentum_{it} + industry\ fixed\ effects + \varepsilon$

The first dimension, *Compliance costs* is a vector variable that comprises *Size*, that is, the natural logarithm of total assets, *ROA*, that is, return on assets calculated as the difference between net income and interest expense on debt divided by average total assets during the fiscal year, and *Leverage*, that is, total assets less common equity divided by total assets. The second dimension, *Financing needs*, comprises *Sales growth*, that is, the two-year average of sales growth. The third dimension, *Liquidity*, comprises two measures of liquidity measured over a 250 trading days prior to the respective event date, namely the *Bid-ask spread*, that is, the natural logarithm of the median bid-ask spread mid-point scaled (e.g., Christensen et al., 2013), and the percentage of zero return days *(% zero return days)*. As outlined in section 3.3.3, firms are more likely to opt out of the EU-regulated market if they are small, less profitable, more leveraged, have less financing needs, and are less liquid. Consequently, if a firm suffers from an unfavorable cost-benefit tradeoff of the listing in the EU-regulated market, and that view is shared by investors, the market reaction to decreases (increases) in opt out requirements is negatively (positively) associated with *Size*, *ROA*, and *Sales growth*, and positively (negatively) associated with *Leverage*, *Bid-ask-spread*, and *% zero return days*. In contrast, if investors of these firms value the bonding of the respective firm to the EU-regulated market, and fear that the firm might leave the EU-regulated market under reduced opt out requirements, the association with the above mentioned variables is reversed.

The fourth dimension, *Ownership concentration*, is measured at the respective event date and comprises *Free Float*, that is, the percentage of free floating shares, and *Individual holdings*, that is, the percentage of shares strategically held by individuals (owners and employees). The final vector variable, *Commitment*, measures the level of commitment to increased disclosure. *Commitment* comprises *Prime Standard*, a binary variable indicating that a firm is listed in the Prime Standard segment of FSE, *Voluntary IFRS adoption*, a binary variable indicating that a firm voluntarily adopted IFRS prior to 2005, *Error announcement*, a binary variable indicating that a firm has been censured under the enforcement mechanism in the past fiscal year, and *Delayed reporting*, a binary variable indicating that a firm published at least one of the last two financial reports after the legal deadline of fourth months. As elaborated in section 3.3.3, firms are presumably more likely to opt out of the EU-regulated market when ownership concentration is high and the firm's level of commitment to increased disclosure is low. If investors of these firms value the bonding of the respective firm to the EU-regulated market, and fear that the firm might leave the EU-regulated market under reduced opt out requirements, the market reaction to decreases (increases) in opt out requirements is negatively (positively) associated with *Individual holdings*, *Error announcement*, and *Delayed reporting* and positively associated with *Free Float*, *Prime Standard*, and *Voluntary IFRS adoption*. If investors share the view of an unfavorable cost-benefit tradeoff for these firms, the association with the above mentioned variables is reversed. For events that relate to the decrease in the degree of regulation (event No. 1 − event No. 4), the last dimension also includes *Downlisting*, a binary variable indicating that a firm subsequently downlisted under the reduced regulation. If investors already suspect that the firm is a likely downlisting candidate, and investors value the bonding to the EU-regulated market (share the view of an unfavorable cost-benefit tradeoff), *Downlisting* is negatively (positively) associated with reduced opt out requirements.

I follow Larcker et al. (2011) and Ferri and Maber (2013) and include *Momentum*, that is, the market adjusted return over 250 trading days prior to the respective event, as a control variable. Finally, I follow Cai and Walkling (2011) and Zhang (2007) and include industry controls. In order to ensure that data from financial statements was already publicly known at the respective event date, data from financial statements is measured at the last fiscal year end for which the financial statement has already been published at the respective event date. Definitions of variables are summarized in Table 3.2.

**Table 3.2:**     Variables

| *Variables* | *Description* |
|---|---|
| *CMAR* | Three-day [-1;1] market adjusted return relative to the FTSE Europe excluding Germany around the respective event date |
| *CAVol* | Three-day [-1;1] relative abnormal trading volume, i.e., trading volume less 250 trading day mean trading volume, around the respective event date. Trading volume is the number of shares traded divided by the number of free float shares |
| *Size* | Natural logarithm of total assets at the last fiscal year end, winsorized at the 1% and 99% level |
| *ROA* | Return on assets (net income less interest expense on debt divided by average total assets) at the last fiscal year end, winsorized at the 1% and 99% level |
| *Leverage* | Total assets less common equity divided by total assets at the last fiscal year end, winsorized at the 1% and 99% level |
| *Sales growth* | Two-year average of sales growth at the last fiscal year end, winsorized at the 1% and 99% level |
| *Bid-ask spread* | Natural logarithm of median bid-ask spread over 250 trading days prior to the respective event (i.e., price ask minus price bid divided by price bid plus half the difference between price ask and price bid) |
| *% zero return days* | Percentage of zero return days over 250 trading days prior to the respective event |
| *Free float* | Percentage of free float shares (i.e., ownership of less than 5%) on the respective event date |
| *Individual holdings* | Percentage of shares strategically held (i.e., ownership of at least 5%) by natural persons (owners and employees) on the respective event date |
| *Prime Standard* | Binary variable indicating that a firm is listed in the Prime Standard segment of the Frankfurt Stock Exchange (FSE) |
| *Voluntary IFRS adoption* | Binary variable indicating that a firm voluntarily applied IFRS or US-GAAP in 2004 |
| *Error announcement* | Binary variable indicating that a firm had to publish an error announcement following an investigation by FREP/BaFin in the last fiscal year |
| *Delayed reporting* | Binary variable indicating that a firm published one or two financial reports after the legal deadline of four months in the last two fiscal years |
| *Downlisting* | Binary variable indicating that a firm downlisted subsequently |
| *Momentum* | Market adjusted return over 250 trading days prior to the respective event |

This table summarizes all variables used in Tables 3.5, 3.6, 3.8, and 3.9.

I estimate the determinants model for a pooled sample compromising all four (six) events leading to the decline (increase) in opt out requirements (e.g., Armstrong et al., 2010; Joos and Leung, 2013). This pooled analysis enables me to capture effects that are small on the individual event level but occur on multiple events (Larcker et al., 2011). Since I obtain multiple observations for each firm and each event in the pooled analysis, standard errors are likely to be cross-sectionally correlated, which might lead to biased standard errors (e.g., Gow et al., 2010; Petersen, 2009). In order to address this, I use bootstrapped standard errors clustered by event (Cameron et al., 2008). Similar to the analysis of pooled market reactions, I also estimate bootstrap p-values obtained from Monte-Carlo simulation to rule out that *CMARs* are also correlated with variables of interest absent regulatory actions. I estimate the regression model for four

(six) randomly selected non-event windows and repeat this procedure 1,000 times to generate the distribution of non-event coefficients (Cai and Walkling, 2011; Zhang, 2007) and calculate bootstrap p-values.

### 3.4.3 Sample selection and data collection

I use a sample of firms listed in the EU-regulated market at the FSE at the respective events, that is, from January 10, 2012, to September 30, 2015. All German firms listed in the EU-regulated market are included in the CDAX segment, which compromises the Prime Standard and the General Standard segment. I identify 4191 firm-event observations of firms listed in the CDAX for which matched financial reports are available. I exclude 240 firm-event observations because of "irregular" delistings, for example, cases of bankruptcy and mergers. Next, I exclude 206 firm-event observations because these firms are listed with preferred shares to avoid double counting, and 47 firm-event observations that have the legal form of a partnership limited by shares ('KGaA') with specific governance structures that would limit comparability with the rest of the sample. I also exclude 161 firm-event observations of banks, 319 firm-event observations due to missing data, and 216 firm-event observations because data was missing for some events for these firms thus limiting comparability over events. For events leading to increases in opt out requirements, I exclude seven firm-event observations of three firms that downlisted after event No. 5 and I also exclude one firm that performed a delisting under the reduced opt out requirements.[16] This leads to a final sample of 2991 firm-event observations, which compromises 281 firms (or 2810 firm-event observations) that were continuously listed over all ten events and 101 (18) firm-event observations (firms) that went public during the period of interest. Further, I include 80 (26) firm-event observations (firms) that downlisted during the period of interest. While I can only control for firm characteristics presumably associated with opting out of the EU-regulated market for most firms, including these firms allows me to clearly identify a set of firms that opted out of the EU-regulated market. Data on market prices, trading volume, and financial statements is obtained from Thomson Reuters Datastream. Data on erroneous financial statements and downlistings is hand collected from Bundesanzeiger (http://www.bundesanzeiger.de) and ad hoc announcements, respectively. The

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[16]  I exclude firms that downlisted during the regulatory process of increased opt out requirements, because these firms had announced their intent to downlist before the regulatory process started and downlisted in the early stages of the regulatory process and were thus not affected by the regulation.

composition of CDAX is obtained from Deutsche Börse (http://www.dax-indices.com). The sample selection process is summarized in Table 3.3.

**Table 3.3:**      Sample selection

|  | N (obs.) | N (firms) |
|---|---|---|
| **Total CDAX with matched financial reports** | **4191** | **524** |
| ./. Irregular delisting (e.g., bankruptcy) | 240 | 75 |
| ./. Preferred shares | 206 | 22 |
| ./. Partnership limited by shares ('KGaA') | 47 | 6 |
| ./. Banks | 161 | 18 |
| ./. Missing data | 319 | 41 |
| ./. Balance sample | 216 | 36 |
| ./. Regular delisting | 4 | 1 |
| ./. Downlisting after event No. 4 | 7 | 0 |
| **Final sample (all events)** | **2991** | **325** |
| *Thereof…* | | |
| *…continuously listed* | *2810* | *281* |
| *…subsequent downlistings* | *80* | *26* |
| *…previous IPOs* | *101* | *18* |
| | | |
| **Final sample (event No. 1 - event No. 4)** | **1216** | **314** |
| **Final sample (event No. 5 - event No. 10)** | **1775** | **297** |

This table summarizes the sample selection process.

## 3.5   Empirical findings

### 3.5.1   *Decrease in opt out requirements (event No. 1 to event No. 4)*

#### 3.5.1.1   *Market reactions*

Table 3.4 summarizes the overall market reactions to reductions in opt out requirements. I find that the overall price reaction (*CMAR*) is significantly positive at the 1% level, when applying traditional parametric and non-parametric test statistics. However, pooled *CMARs* are not significantly higher than those obtained from the Monte-Carlo simulation (insignificant bootstrap p-value) during the same period. The pooled abnormal trading volume (*CAVol*) around events leading to reductions in requirements for opting out of the EU-regulated market is significantly positive based on traditional test statistics (5% and 1% levels, respectively), and also relative to pooled abnormal trading volume around non-event windows (1% level). In fact, pooled *CAVol* is higher than around all simulated pooled non-event windows, which indicates that the regulation does have an impact on investors.

**Table 3.4:** Market reactions around event dates (reduced requirements)

*Panel A: Cumulative abnormal returns (CMAR)*

| Event | Impact on the level of regula-tion | Return | FTSE Europe ex. Ger | CMAR | t-stat. | Wilkoxon z-stat. | N |
|---|---|---|---|---|---|---|---|
| 1 | - | 0.016 | 0.018 | -0.001 | (-0.56) | (-1.87)* | 307 |
| 2 | - | 0.003 | -0.002 | 0.005 | (1.58) | (2.60)*** | 305 |
| 3 | - | 0.001 | -0.008 | 0.009 | (4.03)*** | (5.51)*** | 301 |
| 4 | - | 0.007 | -0.002 | 0.009 | (2.60)*** | (2.22)** | 303 |
| | Pooled *CMAR* | | | 0.005 | | | 1216 |
| | t-stat. | | | (3.61)*** | | | |
| | Wilkoxon z-stat. | | | (3.85)*** | | | |
| | Bootstrap p-value | | | (0.160) | | | |

*Panel B: Cumulative abnormal trading volume (CAVol)*

| Event | Impact on the level of regula-tion | | CAVol | t-stat. | Wilkoxon z-stat. | N |
|---|---|---|---|---|---|---|
| 1 | - | | 0.00018 | (2.00)** | ( 0.62) | 170 |
| 2 | - | | 0.00143 | (1.01) | ( -1.39) | 164 |
| 3 | - | | 0.00023 | (2.46)** | ( 0.31) | 166 |
| 4 | - | | 0.00096 | (3.92)*** | (6.42)*** | 173 |
| | Pooled *CAVol* | | 0.00070 | | | 673 |
| | t-stat. | | (1.98)** | | | |
| | Wilkoxon z-stat. | | (3.26)*** | | | |
| | Bootstrap p-value | | (0.000)*** | | | |

This table summarizes market reactions around events that lead to reductions in downlisting and delisting requirements. The boot-strap p-values are obtained from Monte-Carlo simulation, that is, 1000 repetitions of computing mean market reactions over four randomly selected three-day non-event windows from January 2012 to November 2013. The bootstrap p-value is the percentage of simulated market reactions over non-events that are higher than the average market reaction over the four event dates. ***, **, and * indicate two-tailed significance at the 1%, 5%, and 10% levels, respectively. For the bootstrap p-value, ***, **, and * indicate one-tailed significance at the 1%, 5%, and 10% levels, respectively. Variables are defined in Table 3.2.

In a second step, and similar to Fernandes et al. (2010), I test whether market reactions differ among firm characteristics of interest that are presumably associated with a firm's likelihood to be affected by the regulation. For continuous variables, I split the variables into the top and bottom half. Results documented in Table 3.5 Panel A reveal that *CMARs* are significantly higher if ownership dispersion is low (*Free float*) (1% level). Mean *CMARs* are also significantly higher if the percentage of individual investors (*Individual holdings*) is high (5% level) and recent financial reports have been published after the legal deadline (*Delayed reporting*) (5% level), while mean *CMARs* are weakly significantly lower (10% level) for firms that downlist subsequently. With respect to the trading volume (Panel B), *CAVol* differs most profoundly among firms listed in the Prime Standard and General Standard, since *CAVol* is significantly higher (1% and 5%

levels, respectively) for firms listed in the General Standard segment. For firms that downlist subsequently (*Downlisting*), mean *CAVol* is significantly higher than for firms that remain listed (1% level), but median *CAVol* does not differ significantly.

**Table 3.5:** Pooled market reactions (reduced requirements)

*Panel A: Cumulative abnormal returns (CMAR)*

| | high (50%) | | low (50%) | | Diff. | | |
|---|---|---|---|---|---|---|---|
| | CMAR | N | CMAR | N | Diff. | t-stat | Wilkoxon z-stat |
| **Compliance costs** | | | | | | | |
| Size | 0.004 | 608 | 0.006 | 608 | 0.002 | (0.79) | (-0.90) |
| ROA | 0.003 | 608 | 0.007 | 608 | 0.004 | (1.45) | ( 0.33) |
| Leverage | 0.007 | 608 | 0.003 | 608 | -0.003 | (-1.19) | (-1.48) |
| **Financing needs** | | | | | | | |
| Sales growth | 0.003 | 608 | 0.007 | 608 | 0.004 | (1.41) | (1.03) |
| **Liquidity** | | | | | | | |
| Bid-ask spread | 0.007 | 606 | 0.004 | 610 | -0.003 | (-1.11) | (0.11) |
| % zero return days | 0.008 | 626 | 0.002 | 590 | -0.005 | (-1.84)* | (0.51) |
| **Ownership structure** | | | | | | | |
| Free float | 0.001 | 618 | 0.010 | 598 | 0.009 | (3.29)*** | (2.96)*** |
| Individual holdings[1] | 0.008 | 596 | 0.002 | 620 | -0.006 | (-2.15)** | (-1.17) |

| | x=1 | | x=0 | | Diff. | | |
|---|---|---|---|---|---|---|---|
| | CMAR | N | CMAR | N | Diff. | t-stat | Wilkoxon z-stat |
| **Commitment** | | | | | | | |
| Prime Standard | 0.005 | 878 | 0.006 | 338 | 0.001 | (0.43) | (0.08) |
| Voluntary IFRS adoption | 0.005 | 808 | 0.006 | 408 | 0.002 | (0.60) | (0.31) |
| Error announcement | 0.020 | 30 | 0.005 | 1186 | -0.015 | (-1.59) | (-0.99) |
| Delayed reporting | 0.015 | 126 | 0.004 | 1090 | -0.011 | (-2.36)** | (-1.15) |
| Downlisting | -0.005 | 80 | 0.006 | 1136 | 0.010 | (1.79)* | (1.26) |

*(Table 3.5 continued)*

Panel B: Cumulative abnormal trading volume (CAVol)

| | high (50%) | | low (50%) | | Diff. | | |
|---|---|---|---|---|---|---|---|
| | *CAVol* | *N* | *CAVol* | *N* | *Diff.* | *t-stat* | *Wilkoxon z-stat* |
| **Compliance costs** | | | | | | | |
| Size | 0.00069 | 464 | 0.00070 | 209 | 0.00001 | (0.01) | (1.77)* |
| ROA | 0.00030 | 389 | 0.00124 | 284 | 0.00094 | (1.32) | (0.55) |
| Leverage | 0.00094 | 364 | 0.00041 | 309 | -0.00052 | (-0.74) | (1.30) |
| **Financing needs** | | | | | | | |
| Sales growth | 0.00099 | 385 | 0.00030 | 288 | -0.00069 | (-0.96) | (1.42) |
| **Liquidity** | | | | | | | |
| Bid-ask spread | 0.00079 | 143 | 0.00067 | 530 | -0.00012 | (-0.13) | (-3.46)*** |
| % zero return days | 0.00084 | 148 | 0.00066 | 525 | -0.00019 | (-0.22) | (-2.80)*** |
| **Ownership structure** | | | | | | | |
| Free float | 0.00039 | 418 | 0.00120 | 255 | 0.00081 | (1.12) | (1.81)* |
| Individual holdings[1] | 0.00054 | 312 | 0.00083 | 361 | 0.00030 | (0.42) | (-2.31)** |

| | x=1 | | x=0 | | Diff. | | |
|---|---|---|---|---|---|---|---|
| | *CAVol* | *N* | *CAVol* | *N* | *Diff.* | *t-stat* | *Wilkoxon z-stat* |
| **Commitment** | | | | | | | |
| Prime Standard | 0.00033 | 625 | 0.00553 | 48 | 0.005 | (3.84)*** | (2.35)** |
| Voluntary IFRS adoption | 0.00082 | 540 | 0.00020 | 133 | -0.001 | (-0.70) | (1.12) |
| Error announcement | 0.00003 | 13 | 0.00071 | 660 | 0.001 | (0.27) | (1.37) |
| Delayed reporting | 0.00128 | 10 | 0.00069 | 663 | -0.001 | (-0.20) | (-2.10)** |
| Downlisting | 0.01570 | 15 | 0.00035 | 658 | -0.015 | (-6.63)*** | (-0.73) |

This table compares market reactions across firm characteristics presumably associated with a firm's likelihood to opt out of the EU-regulated market for events that lead to reductions in the requirements for opting out of the EU-regulated market. Continuous variables are split into the top and bottom half. For the analysis of *CAVol* in Panel B, the top and bottom half from Panel A are maintained. ***, **, and * indicate two-tailed significance at the 1%, 5%, and 1% levels, respectively.

[1]For *Individual holdings*, "high" is holdings of 5% or more, "low" is holdings below 5%.

### 3.5.1.2 Determinants model

In the multivariate analyses, I first estimate coefficients for all variables of interest separately, including only the respective variable of interest and *Momentum*, to rule out that coefficients are affected by correlated variables of interest. Coefficients from these analyses are reported in Model (1) in Table 3.6. In a second step, I estimate the full model (Model (2) in Table 3.6).[17] Descriptive statistics are reported in Appendix B. Since the full model mostly confirms findings from the separate estimations in Model (1), I confine the discussion of the results to Model (2), which mostly confirms univari-

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[17] Since *Bid-ask spread* and *% zero return days* both capture liquidity and are highly correlated (0.591), I only include *Bid-ask spread* in the full model. However, I re-estimate the model using *% zero return days* instead of *Bid-ask spread* and inferences remain unchanged.

ate findings reported in Table 3.5 Panel A. Based on both test statistics, the traditional z-statistic and the bootstrap p-value, *CMARs* are significantly more positive when *Leverage* is high (1% and 5% levels, respectively), ownership dispersion is low (5% level), and the percentage of individual investors is high (5%). Investors of firms that have been censured under the enforcement regime (*Error announcement*) also react significantly more positive to the decrease in opt out requirements (5% level), while investors of firms that downlist subsequently react significantly more negative (10% and 5% level, respectively).[18]

**Table 3.6:**     Determinants of market reactions (reduced requirements)

| | Dependent variable: *CMAR* | | | | |
| | Model (1) | | Model (2) | | |
| | *Coeff.* | *z-stat.* | *Coeff.* | *z-stat.* | *bootstrap p-value* |
| --- | --- | --- | --- | --- | --- |
| ***Compliance costs*** | | | | | |
| *Size* | 0.000 | (-0.14) | 0.001 | (1.26) | (0.282) |
| *ROA* | -0.017 | (-1.49) | -0.009 | (-1.46) | (0.176) |
| *Leverage* | 0.019 | (3.31)*** | 0.016 | (2.79)*** | (0.034)** |
| ***Financing needs*** | | | | | |
| *Sales growth* | 0.000 | (-0.09) | 0.002 | (0.44) | (0.316) |
| ***Liquidity*** | | | | | |
| *Bid-ask spread* | 0.002 | (0.65) | 0.003 | (0.65) | (0.373) |
| *% zero return days* | 0.016 | (1.07) | | | |
| ***Ownership structure*** | | | | | |
| *Free float* | -0.018 | (-2.84)*** | -0.012 | (-2.35)** | (0.037)** |
| *Individual holdings* | 0.021 | (4.19)*** | 0.014 | (2.23)** | (0.024)** |
| ***Commitment*** | | | | | |
| *Prime Standard* | -0.002 | (-0.42) | 0.005 | (1.82)* | (0.109) |
| *Voluntary IFRS adoption* | -0.002 | (-1.15) | -0.001 | (-0.48) | (0.289) |
| *Error announcement* | 0.015 | (2.07)** | 0.014 | (2.04)** | (0.032)** |
| *Delayed reporting* | 0.012 | (1.23) | 0.012 | (1.53) | (0.029)** |
| *Downlisting* | -0.012 | (-1.98)** | -0.013 | (-1.90)* | (0.020)** |
| N | 1216 | | 1216 | | |
| Adjusted $R^2$ | - | | 0.02 | | |
| Industry-fixed effects | yes | | yes | | |
| Controls | yes | | yes | | |
| Standard errors | clustered (event) | | clustered (event) | | |

This table summarizes results on estimating the determinants of *CMARs*, for events leading to reductions in opt out requirements using bootstrapped standard errors (1000 reps.) clustered by event. Model (1) displays the coefficients from estimating the model for each variable separately using controls and industry-fixed effects. Coefficients for Model (2) are obtained from estimating the full model. z-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels (two-tailed), respectively. Bootstrap p-values are the percentage of coefficients drawn from 1,000 repetitions of randomly selecting four non-events and estimating Model (2) across these non-event windows that are higher (for positive coefficients) or lower (for negative coefficients) than those of Model (2). For the bootstrap p-values, ***, **, and * indicate one-tailed significance at the 1%, 5%, and 10% levels, respectively. Variables are defined in Table 3.2.

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[18]    Apart from using variables that capture firms that are presumably more affected by the regulation, I also build on results from Hitz and Müller-Bloch (2016) and calculate the estimated downlisting likelihood based on variables that Hitz and Müller-Bloch (2016) have documented to have an impact on a firm's likelihood to downlist. I do not find that market reactions differ among the perceived likelihood of a firm to downlist.

*3.5.1.3 Robustness test*

To assess the robustness of the results, I re-estimate Model (2) using three-day cumulative abnormal returns (*CAR*), as proposed by MacKinlay (1997) (untabulated). *CARs* are estimated over 250 trading days prior to the respective event using the FTSE Europe excluding Germany as the market index. I find that the pooled price reaction to events leading to reductions in opt out requirements is positive but insignificant. When re-estimating the full model using *CARs* instead of *CMARs*, results mostly persist. *CARs* are significantly more positive when *Leverage* is high (5% level), *Individual holdings* are high (5% level), and the firm has been censured by FREP or BaFin in the past fiscal year (*Error announcement*) (5% level). Although insignificant, results on ownership dispersion and subsequent downlistings point into the same direction as the results documented in Table 3.6 Model (2).

*3.5.2 Increase in opt out requirements (event No. 5 to event No. 10)*

*3.5.2.1 Market reactions*

For events leading to increases in requirements for opting out of the EU-regulated market, mean *CMARs* are slightly positive but insignificant using traditional test statistics and bootstrap p-values (Table 3.7 Panel A). Pooled *CAVols* are also slightly positive and, using traditional test statistics, differ significantly from zero (1% level) (Panel B). Nevertheless, they do not differ significantly from *CAVols* obtained from Monte-Carlo simulation of non-event dates. Non-parametric test statistics are also insignificant. Hence, no inferences can be drawn from overall market reactions around events leading to increases in requirements.

When examining whether market reactions vary across firm characteristics, the analysis of *CMARs* as reported in Table 3.8 Panel A reveals that *CMARs* are significantly more negative if the firm has been censured under the enforcement mechanism in the past fiscal year (10% level). When assessing statistical significance based on parametric and non-parametric test statistics, *CAVol* does not differ significantly across firm characteristics.

**Table 3.7:** Market reactions around event dates (increased requirements)

*Panel A: Cumulative abnormal returns (CMAR)*

| Event | Impact on the level of regula-tion | Return | FTSE Europe ex. Ger | CMAR | t-stat. | Wilkoxon z-stat. | N |
|-------|------|--------|--------|--------|---------|---------|------|
| 5 | + | 0.013 | -0.002 | 0.015 | (5.96)*** | (5.94)*** | 294 |
| 6 | + | 0.001 | -0.003 | 0.004 | (1.50) | (1.73)* | 294 |
| 7 | + | -0.004 | -0.002 | -0.002 | (-0.92) | (3.45)*** | 296 |
| 8 | + | 0.016 | 0.004 | 0.011 | ( 5.28)*** | (5.25)*** | 297 |
| 9 | + | -0.029 | -0.017 | -0.012 | (-4.89)*** | (-6.40)*** | 297 |
| 10 | + | 0.017 | 0.023 | -0.006 | ( -2.19)** | ( -4.10)*** | 297 |
| | | Pooled CMAR | | 0.002 | | | 1775 |
| | | t-stat. | | ( 1.51) | | | |
| | | Wilkoxon z-stat. | | (-0.54) | | | |
| | | Bootstrap p-value | | (0.427) | | | |

*Panel B: Cumulative abnormal trading volume (CAVol)*

| Event | Impact on the level of regula-tion | | CAVol | t-stat. | Wilkoxon z-stat. | N |
|-------|------|---|--------|---------|---------|------|
| 5 | + | | 0.00055 | (3.72)*** | ( 6.16)*** | 176 |
| 6 | + | | 0.00035 | (3.25)*** | ( 3.28)*** | 174 |
| 7 | + | | 0.00008 | (1.33) | (-0.98) | 172 |
| 8 | + | | -0.00007 | (-1.62) | (-4.50)*** | 157 |
| 9 | + | | 0.00003 | (0.60) | (-2.88)*** | 174 |
| 10 | + | | 0.00001 | (0.16) | (-2.01)** | 163 |
| | | Pooled CAVol | 0.00016 | | | 1016 |
| | | t-stat. | (4.57)*** | | | |
| | | Wilkoxon z-stat. | (0.27) | | | |
| | | Bootstrap p-value | (0.895) | | | |

This table summarizes market reactions around events that lead to increases in downlisting and delisting requirements. The bootstrap p-values are obtained from Monte-Carlo simulation, that is, 1000 repetitions of computing mean market reactions over six randomly selected three-day non-event windows from March 2015 to September 2015. The bootstrap p-value is the percentage of simulated market reactions over non-events that are higher than the average market reaction over the six event dates. ***, **, and * indicate two-tailed significance at the 1%, 5%, and 10% levels, respectively. For the bootstrap p-value, ***, **, and * indicate one-tailed significance at the 1%, 5%, and 10% levels, respectively. Variables are defined in Table 3.2.

**Table 3.8:** Pooled market reactions (increased requirements)

*Panel A: Cumulative abnormal returns (CMAR)*

| | high (50%) | | low (50%) | | Diff. | | |
|---|---|---|---|---|---|---|---|
| | CMAR | N | CMAR | N | Diff. | t-stat | Wilkoxon z-stat |
| **Compliance costs** | | | | | | | |
| Size | 0.001 | 887 | 0.002 | 888 | 0.001 | (0.34) | (-0.57) |
| ROA | 0.001 | 886 | 0.002 | 889 | 0.001 | (0.54) | (-0.06) |
| Leverage | 0.001 | 892 | 0.002 | 883 | 0.000 | (0.23) | (0.22) |
| **Financing needs** | | | | | | | |
| Sales growth | 0.002 | 888 | 0.001 | 887 | -0.002 | (-0.84) | (-1.36) |
| **Liquidity** | | | | | | | |
| Bid-ask spread | 0.002 | 888 | 0.001 | 887 | -0.001 | (-0.62) | (0.93) |
| % zero return days | 0.003 | 955 | 0.000 | 820 | -0.003 | (-1.60) | (-0.62) |
| **Ownership structure** | | | | | | | |
| Free float | 0.001 | 904 | 0.003 | 871 | 0.002 | (1.00) | (0.92) |
| Individual holdings[1] | 0.003 | 879 | 0.000 | 896 | -0.003 | (-1.50) | (-1.02) |

| | x=1 | | x=0 | | Diff. | | |
|---|---|---|---|---|---|---|---|
| | CMAR | N | CMAR | N | Diff. | t-stat | Wilkoxon z-stat |
| **Commitment** | | | | | | | |
| Prime Standard | 0.001 | 1328 | 0.004 | 447 | 0.004 | (1.55) | (-0.04) |
| Voluntary IFRS adoption | 0.001 | 1176 | 0.002 | 599 | 0.001 | (0.62) | (-1.72)* |
| Error announcement | -0.014 | 30 | 0.002 | 1745 | 0.016 | (1.96)* | (1.93)* |
| Delayed reporting | 0.009 | 192 | 0.001 | 1583 | -0.009 | (-2.67)*** | (-0.47) |

*Panel B: Cumulative abnormal trading volume (CAVol)*

| | high (50%) | | low (50%) | | Diff. | | |
|---|---|---|---|---|---|---|---|
| | CAVol | N | CAVol | N | Diff. | t-stat | Wilkoxon z-stat |
| **Compliance costs** | | | | | | | |
| Size | 0.00006 | 682 | 0.00037 | 334 | 0.00030 | (4.00)*** | (-0.72) |
| ROA | 0.00013 | 558 | 0.00021 | 458 | 0.00008 | (1.07) | (-0.14) |
| Leverage | 0.00013 | 548 | 0.00020 | 468 | 0.00007 | (0.98) | (0.17) |
| **Financing needs** | | | | | | | |
| Sales growth | 0.00018 | 534 | 0.00014 | 482 | -0.00004 | (-0.61) | (-0.12) |
| **Liquidity** | | | | | | | |
| Bid-ask spread | 0.00049 | 267 | 0.00005 | 749 | -0.00045 | (-5.62)*** | (-0.46) |
| % zero return days | 0.00036 | 337 | 0.00007 | 679 | -0.00029 | (-3.91)*** | (0.85) |
| **Ownership structure** | | | | | | | |
| Free float | 0.00011 | 656 | 0.00027 | 360 | 0.00016 | (2.16)** | (0.84) |
| Individual holdings[1] | 0.00024 | 477 | 0.00010 | 539 | -0.00015 | (-2.03)** | (1.63) |

*(Table 3.8 continued)*

| | x=1 | | x=0 | | Diff. | | |
|---|---|---|---|---|---|---|---|
| | *CAVol* | *N* | *CAVol* | *N* | *Diff.* | *t-stat* | *Wilkoxon z-stat* |
| ***Commitment*** | | | | | | | |
| *Prime Standard* | 0.00015 | 932 | 0.00034 | 84 | 0.000 | (1.47) | (-1.23) |
| *Voluntary IFRS adoption* | 0.00017 | 754 | 0.00015 | 262 | 0.000 | (-0.15) | (-2.14)** |
| *Error announcement* | -0.00018 | 15 | 0.00017 | 1001 | 0.000 | (1.18) | (3.25)*** |
| *Delayed reporting* | 0.00017 | 37 | 0.00016 | 979 | 0.000 | (-0.03) | (1.22) |

This table compares market reactions across firm characteristics presumably associated with a firm's likelihood to opt out of the EU-regulated market for events that lead to increases in the requirements for opting out of the EU-regulated market. Continuous variables are split into the top and bottom half. For the analysis of *CAVol* in Panel B, the top and bottom half from Panel A are maintained. ***, **, and * indicate two-tailed significance at the 1%, 5%, and 1% levels, respectively.

[1]For *Individual holdings*, "high" is holdings of 5% or more, "low" is holdings below 5%.

### 3.5.2.2    Determinants model

Table 3.9 reports the multivariate results, both for the individual variables of interest (Model (1)) and for the full model (Model (2)).[19] Descriptive statistics are reported in Appendix C. Again, findings are in line with those from the univariate analysis as reported in Table 3.8 Panel A. The only coefficient on a variable of interest that is significantly different from zero in Model (1) and Model (2), and significantly different from its non-event distribution obtained from Monte-Carlo simulation, is *Error announcement*. Investors of firms that have been censured under the enforcement regime in the past fiscal year react significantly more negative to increases in the requirements for opting out of the EU-regulated market.[20]

### 3.5.2.3    Robustness test

Again, I re-estimate my analyses using *CARs* instead of *CMARs* (untabulated). I find that mean *CARs* are slightly positive but insignificant, while median *CARs* are slightly negative and weakly significant (10% level), which is in line with the inconclusive findings reported in Table 3.7 Panel A. When re-estimating Model (2) from Table 3.9 using *CARs*, findings on *Error announcement* are confirmed. The coefficient on *Error announcement* is significantly negative at the 10% level. The coefficient on *Delayed reporting* is also weakly significantly positive (10% level).

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[19]    As outlined in footnote 17, I estimate the full model (Model (2)) using *Bid-ask spread* only. Inferences remain the same, except for the fact that *Free float* is also significant in the full model when using % zero return days.

[20]    Again, market reactions do not differ among the perceived downlisting likelihood as outlined in footnote 18.

**Table 3.9:** Determinants of market reactions (increased requirements)

| | Dependent variable: *CMAR* | | | | |
| --- | --- | --- | --- | --- | --- |
| | Model (1) | | | Model (2) | |
| | *Coeff.* | *z-stat.* | | *Coeff.* | *z-stat.* | *bootstrap p-value* |
| ***Compliance costs*** | | | | | |
| *Size* | 0.000 | (-0.31) | | 0.002 | (2.37)** | (0.132) |
| *ROA* | -0.013 | (-1.38) | | -0.016 | (-1.68)* | (0.205) |
| *Leverage* | 0.004 | (1.51) | | -0.001 | (-0.17) | (0.716) |
| ***Financing needs*** | | | | | |
| *Sales growth* | 0.004 | (0.99) | | 0.003 | (0.72) | (0.102) |
| ***Liquidity*** | | | | | |
| *Bid-ask spread* | 0.002 | (1.25) | | 0.004 | (1.60) | (0.235) |
| *% zero return days* | 0.012 | (1.47) | | | | |
| ***Ownership structure*** | | | | | |
| *Free float* | -0.006 | (-1.89)* | | -0.003 | (-0.88) | (0.108) |
| *Individual holdings* | 0.004 | (1.02) | | 0.003 | (0.95) | (0.529) |
| ***Commitment*** | | | | | |
| *Prime Standard* | -0.004 | (-1.33) | | 0.001 | (1.00) | (0.146) |
| *Voluntary IFRS adoption* | -0.003 | (-1.17) | | -0.001 | (-0.59) | (0.127) |
| *Error announcement* | -0.015 | (-1.73)* | | -0.016 | (-1.79)* | (0.010)** |
| *Delayed reporting* | 0.008 | (1.38) | | 0.008 | (1.52) | (0.059)* |
| N | 1775 | | | 1775 | | |
| Adjusted $R^2$ | - | | | 0.01 | | |
| Industry-fixed effects | yes | | | yes | | |
| Controls | yes | | | yes | | |
| Standard errors | clustered (event) | | | clustered (event) | | |

This table summarizes results on estimating the determinants of *CMARs*, for events leading to increases in opt out requirements using bootstrapped standard errors (1000 reps.) clustered by event. Model (1) displays the coefficients from estimating the model for each variable separately using controls and industry-fixed effects. Coefficients for Model (2) are obtained from estimating the full model. z-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels (two-tailed), respectively. Bootstrap p-values are the percentage of coefficients drawn from 1,000 repetitions of randomly selecting four non-events and estimating Model (2) across these non-event windows that are higher (for positive coefficients) or lower (for negative coefficients) than those of Model (2). For the bootstrap p-values, ***, **, and * indicate one-tailed significance at the 1%, 5%, and 10% levels, respectively. Variables are defined in Table 3.2.

### 3.5.3 Discussion

Findings on mean market reactions around events leading to reductions in requirements for opting out of the EU-regulated market indicate that reductions in these requirements matter to investors, since *CAVol* around the event dates is significantly positive. In particular, firms listed in the General Standard segment, that is, firms that have not bonded to the premium segment, the Prime Standard, experience a significantly higher *CAVol*. This evidence is in line with the expectation that these firms are more affected by the regulation, since they did not commit to bonding to even stricter requirements prior to the regulation, and are thus presumably more likely to opt out. In fact, out of 26 firms in

the final sample that downlist, 15 firms are listed in the General Standard segment, that is, 16.5% of the General Standard firms downlist. In contrast, only 4.7% of sample firms listed in the Prime Standard segment downlist during the period of interest. Firms that downlist subsequently under the reduced regulation also seem to be, on average, more affected by the reduced regulation.

Trading volume reactions around increases in opt out requirements are insignificant, indicating that increases in opt out requirements matter less to investors. This might be attributable to the fact that increases in requirements could have been stricter, by, for example, requiring firms to provide a majority vote by the shareholders' meeting or to determine compensation for minority investors in a so-called "Spruchverfahren", a court procedure to verify the adequacy of the compensation offer that can easily take years (e.g., Loosen, 2013). Another explanation for the little significance of the results might be that firms eligible to opt out of the EU-regulated market had already done so prior to the increased regulation.

Under the bonding hypothesis, market reactions to reductions in opt out requirements are expected to be negative, while market reactions are expected to be positive if investors share considerations of an unfavorable cost-benefit tradeoff, as proposed under the loss of competitiveness theory. Evidence on *CMARs* reveals that, although mean *CMARs* are positive, they do not differ significantly from simulated non-event *CMARs*. This is not necessarily surprising, since market reactions are likely to differ across firms characteristics depending on whether a firm is affected by the regulatory changes. Investors of firms that are presumably more affected by the regulation, as stricter listing regimes are more costly for firms with stronger insider control (Marosi and Massoud, 2008), react more positively to the regulation. This finding indicates that, for these firms, being able to opt out of the EU-regulated market might increase firm value from an investor perspective, which points towards potential cost considerations regarding the listing in the EU-regulated market. The finding contradicts findings by Fernandes et al. (2010) and Doidge et al. (2010), who both provide evidence that the market reaction to reduced opt out requirements is more positive if ownership concentration is high. Consequently, the rationale that investors of firms with high ownership concentration, and thus presumably more agency problems, value the bonding to increased disclosure requirements does not translate to the German setting.

Investors of firms that have been censured by FREP or BaFin react significantly more positive to the reduced regulation. These firms have shown low commitment to increased disclosure by not sticking to mandated disclosure and reporting requirements. Consistent with this observation, the market reaction to increases in opt out requirements is significantly negative if the firm has been recently censured. As documented by Hitz and Müller-Bloch (2016), these firms are more likely to opt out of the EU-regulated market, and are thus more affected by the regulation. For these firms, being able to opt out at low costs might be valuable from an investor perspective, which supports the loss of competitiveness theory.

Price reactions to reductions in opt out requirements are also significantly more positive if leverage is high. If leverage is interpreted as a measure of financial distress, this finding is in line with the loss of competitiveness theory as investors of these firms seem to welcome being able to opt out of the costly listing in the EU-regulated market. Nevertheless, a strong banking relationship as reflected in high leverage can also be interpreted as a monitoring device that prevents opportunistic behavior (e.g., Diamond, 1984). In that case, investors of these firms might attribute less value to the costly bonding to the EU-regulated market, since firms are already monitored by banks. Following this line of thought, the finding on leverage can also be aligned with the bonding hypothesis as the market reaction is less positive for less leveraged firms, that is, firms for which the bonding to the EU-regulated market is valuable from an investor perspective. Note though that Hitz and Müller-Bloch (2016) do not find evidence that downlisting firms are more leveraged than firms that remain in the EU-regulated market. Similarly, Pasch et al. (2015) document that downlisting firms are not characterized by abnormally high leverage. Also, Fernandes et al. (2010) and Doidge et al. (2010) do not find evidence of an impact of leverage on market reactions to reductions in opt out requirements.

Investors of firms that downlist under the reduced regulation react significantly more negative to the regulatory changes. This finding points towards potential agency considerations of investors, which would be in line with prior evidence on cross-listings (Doidge et al., 2010; Fernandes et al., 2010). Consequently, investors of these firms value the bonding to the EU-regulated market. Another likely explanation for the negative price reaction is that investors anticipated, or knew, that these firms were going to downlist and were hoping for compensation. While investors were still able to hope for compensation prior to the ruling of the German Constitutional Court, the court decision

established that downlisting did not interfere with ownership rights, and consequently no offer for compensation was required.[21] In line with this, 12 out of the 26 firms that downlisted subsequently had already announced their intent to downlist prior to event No. 4. For these investors, reduced requirements for opting out of the EU-regulated market meant that potentially anticipated wealth increases from compensation were no longer possible.

Overall, findings on determinants of market reactions to reduced opt out requirements can be mainly aligned with the loss of competitiveness theory, while some findings can also be aligned with the bonding theory. Little inferences can be drawn from market reactions to increases in opt out requirements. Even though findings on variables of interest are mostly insignificant, they partly point into the same direction as around the events leading to reductions in opt out requirements. One explanation for this pattern might be that, by providing a legal framework for opting out of the EU-regulated market that does not require shareholders' consent, the regulation might actually facilitate opt outs as criticized by investor protection institutions (FAZ, 2015b).

My findings are subject to limitations. First, I am not able to directly measure costs of the listing and whether investors benefit from bonding to the EU-regulated market. I thus merely provide descriptive evidence on market reactions of firms presumably more affected by the regulation. Second, my measure of economic impact, firm value, reflects only shareholder welfare and does not reflect the impact of the regulation on the welfare of other stakeholders, such as creditors or employees. Third, event study methodology relies on the identification of the events of interest. Since it was not possible to identify the exact publication date for the court rulings prior to 2012, which are likely to have had an impact on the costs of being able to downlist, the market assessment of these events is not recognized. Finally, I do not investigate the impact of the regulatory changes on firms listed in the exchange-regulated market. These firms are affected by the regulation since changes in opt out requirements affect the value of the bonding to the EU-regulated market, which is an option for these firms.

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[21] Regional court decisions from 2007 to 2009 had already established that no compensation was required. Nevertheless, investors, e.g., the shareholders of FRoSTA, were still trying to receive compensation via legal proceedings.

### 3.6 Conclusion

This paper exploits an exogenous shock to recent changes in the requirements for opting out of the highly regulated EU-regulated market in Germany. Firms that opt out of the EU-regulated market downlist to the less regulated exchange-regulated market. I investigate whether the bonding to the EU-regulated market is valued by investors or whether investors welcome being able to leave the EU-regulated market, as proposed under the loss of competitiveness theory. The German setting, where opt out requirements increased again following a stepwise reduction, allows me to draw inferences on the effects of being able to opt out of the EU-regulated market on shareholder welfare.

Unlike prior U.S. findings that indicate that investors value the bonding to high disclosure requirements (Doidge et al., 2010; Fernandes et al., 2010), my findings are mainly indicative of cost considerations that are shared by investors, consistent with the loss of competitiveness theory. For firms with high ownership concentration or previous error findings, and financially distressed firms, the costs of the listing seem to outweigh the benefits of the listing, and being able to opt out might be reasonable from an investor perspective. Nevertheless, findings on leverage can also be interpreted under the bonding hypothesis as investors of firms that are less leveraged, and thus only weakly monitored by banks, react more negatively to the reduced regulation. Also in contrast to the loss of competitiveness theory, firms that opt out subsequently under the reduced regulation experience significantly negative price reactions to reductions in opt out requirements. This might indicate that investors in fact value the bonding to stricter disclosure requirements in the EU-regulated market. However, it is also possible that this price reaction is attributable to the fact that investors were hoping for compensation. If investors had anticipated compensation, they would incur welfare decreases when compensation is no longer required by law. Overall, while reductions in opt out requirements seem to have an impact on investors, as reflected in abnormally high trading volume, increases in the requirements for opting out do not. This finding might be attributable to the characteristics of the regulation. However, a likely reason for this finding is that firms, for which opting out constituted a reasonable option, had already left the EU-regulated market.

Overall, this paper's findings extend prior U.S. evidence as they show that, in some cases, investors seem to welcome being able to opt out of the EU-regulated market. Thus, this paper cautions that in the German continental European setting, where firms that

opt out remain within the same jurisdiction, the cost-benefit tradeoff seems to occasionally outweigh the bonding to stricter disclosure requirements in the EU-regulated market. Consequently, U.S. findings on changes in opt out requirements do not necessarily translate to the continental European environment, where a substantial number of firms has recently opted out from increased disclosure requirements (Fiechter et al., 2016; Pasch et al., 2015). These findings should also be of particular interest for regulators, as, unlike argued by regulators, weak trading volume reactions around events related to increases in opt out requirements indicate that the regulation did not matter much to investors.

## 3.7   Appendix

*Appendix A: Ownership structure across market segments of FSE (as of June 10, 2016)*

*Panel A:Ownership structure across market segments of FSE*

| Owner | EU-regulated market | | | Exchange-regulated market | |
|---|---|---|---|---|---|
| | All | Prime Standard (PS) | General Standard (GS) | Entry Standard (ES) | Down-listing (DL) |
| | *Mean* | *Mean* | *Mean* | *Mean* | *Mean* |
| **Public ("free float")** | **0.413** | **0.472** | **0.278** | **0.350** | **0.272** |
| **Industrial firms** | **0.295** | **0.240** | **0.421** | **0.320** | **0.370** |
| **Institutions** | **0.157** | **0.170** | **0.128** | **0.125** | **0.157** |
|    Bank & financial | 0.073 | 0.075 | 0.067 | 0.067 | 0.127 |
|    Pension fund | 0.045 | 0.055 | 0.020 | 0.026 | 0.023 |
|    Insurance | 0.009 | 0.010 | 0.006 | 0.001 | - |
|    Venture capital | 0.008 | 0.010 | 0.004 | 0.007 | - |
|    Private equity | 0.020 | 0.016 | 0.030 | 0.016 | - |
|    Hedge fund | 0.000 | 0.000 | - | 0.000 | - |
|    Other | 0.002 | 0.003 | 0.001 | 0.008 | 0.008 |
| **Individuals** | **0.116** | **0.094** | **0.165** | **0.202** | **0.196** |
|    Owner & employees | 0.002 | 0.002 | 0.003 | 0.005 | 0.006 |
|    Family & individuals | 0.112 | 0.090 | 0.162 | 0.197 | 0.191 |
|    Other | 0.001 | 0.002 | - | - | - |
| **Foundations** | **0.011** | **0.014** | **0.004** | **0.001** | **-** |
| **Government** | **0.002** | **0.003** | **0.000** | **-** | **-** |
| **Self owned** | **0.006** | **0.007** | **0.003** | **0.002** | **0.005** |
| *Number of firms* | 339 | 236 | 103 | 112 | 31 |

*Panel B: Analysis of differences between segments*

| Owner | PS vs. GS | | PS & GS vs. ES | | PS & GS vs. DL | | GS vs. ES | | GS vs. DL | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Diff.* | *t-stat.* | *Diff.* | *t-stat.* | *Diff.* | *t-stat.* | *Diff.* | *t-stat.* | *Diff.* | *t-stat.* |
| **Public ("free float")** | **-0.194** | **(-6.98)***** | **-0.063** | **(-2.37)**** | **-0.141** | **(-3.05)***** | **0.072** | **(2.28)**** | **-0.006** | **( -0.13)** |
| **Industrial firms** | **0.181** | **(5.18)***** | **0.024** | **(0.72)** | **0.075** | **(1.28)** | **-0.101** | **(-2.16)**** | **-0.051** | **(-0.68)** |
| **Institutions** | **-0.042** | **(-1.78)*** | **-0.033** | **(-1.47)** | **-0.000** | **(-0.00)** | **-0.004** | **(-0.13)** | **0.029** | **(0.63)** |
|    Bank & financial | -0.008 | (-0.43) | -0.006 | ( -0.33) | 0.054 | (1.74)* | 0.000 | (-0.01) | 0.060 | ( 1.47) |
|    Pension fund | -0.035 | (-3.84)*** | -0.019 | (-2.04)** | -0.022 | (-1.46) | 0.006 | ( 0.57) | 0.003 | ( 0.21) |
|    Insurance | -0.004 | (-0.75) | -0.008 | (-1.94)* | - | - | -0.005 | ( -1.42) | - | - |
|    Venture capital | -0.006 | (-1.30) | -0.001 | (-0.27) | - | - | 0.003 | (0.46) | - | - |
|    Private equity | 0.014 | (1.49) | -0.005 | (-0.54) | - | - | -0.014 | (-1.02) | - | - |
|    Hedge fund | - | - | 0.000 | (-0.97) | - | - | - | - | - | - |
|    Other | -0.002 | (-0.89) | 0.006 | ( 1.73)* | 0.006 | (1.34) | 0.008 | (1.43) | 0.007 | (1.65) |
| **Individualsl** | **0.071** | **(3.21)***** | **0.087** | **(3.76)***** | **0.081** | **(2.16)**** | **0.037** | **(1.07)** | **0.031** | **(0.61)** |
|    Owner & employees | 0.001 | ( 0.29) | 0.003 | (1.46) | 0.003 | (1.03) | 0.003 | (0.78) | 0.003 | (0.60) |
|    Family & individuals | 0.072 | (3.27)*** | 0.085 | (3.69)*** | 0.079 | (2.12)** | 0.035 | (1.00) | 0.028 | (0.56) |
|    Other | - | - | - | - | - | - | - | - | - | - |
| **Foundations** | **-0.010** | **(-1.25)** | **-0.010** | **( -1.54)** | **-** | **-** | **-0.003** | **( -0.85)** | **-** | **-** |
| **Government** | **-0.002** | **( -0.94)** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| **Self owned** | **-0.004** | **(-1.77)*** | **-0.004** | **(-2.02)**** | **-0.000** | **(-0.28)** | **-0.001** | **( -0.74)** | **0.002** | **( 0.77)** |

This table summarizes the ownership structure across different market segments of the Frankfurt Stock Exchange (FSE). Data ist obtained from Amadeus database. Entry Standard includes firms that downlisted previously (DL).

*Appendix B: Descriptive statistics for events leading to reductions in requirements*

Panel A: Descriptives

|  | Mean | Standard Deviation | Min | 25%-Quartile | Median | 75%-Quartile | Max | N |
|---|---|---|---|---|---|---|---|---|
| *CMAR* | 0.005 | 0.050 | -0.326 | -0.014 | 0.004 | 0.021 | 0.569 | 1216 |
| *CAVol* | 0.001 | 0.009 | -0.003 | 0.000 | 0.000 | 0.000 | 0.232 | 673 |
| *Size* | 12.749 | 2.385 | 6.635 | 10.983 | 12.377 | 14.227 | 19.268 | 1216 |
| *ROA* | 0.038 | 0.144 | -0.885 | 0.024 | 0.053 | 0.085 | 0.451 | 1216 |
| *Leverage* | 0.554 | 0.257 | 0.023 | 0.401 | 0.555 | 0.701 | 1.870 | 1216 |
| *Sales growth* | 0.109 | 0.360 | -0.942 | -0.010 | 0.070 | 0.155 | 2.630 | 1216 |
| *Bid-ask spread* | -4.061 | 0.978 | -6.617 | -4.834 | -3.912 | -3.306 | -0.649 | 1216 |
| *% zero return days* | 0.092 | 0.147 | 0.000 | 0.004 | 0.028 | 0.112 | 0.832 | 1216 |
| *Free float* | 0.578 | 0.283 | 0.000 | 0.350 | 0.550 | 0.830 | 1.000 | 1216 |
| *Individual holdings* | 0.175 | 0.238 | 0.000 | 0.000 | 0.000 | 0.330 | 0.960 | 1216 |
| *Downlisting likelihood* | 0.072 | 0.080 | 0.001 | 0.023 | 0.048 | 0.083 | 0.729 | 1108 |
| *Prime Standard* | 0.722 | 0.448 | 0.000 | 0.000 | 1.000 | 1.000 | 1.000 | 1216 |
| *Voluntary IFRS adoption* | 0.664 | 0.472 | 0.000 | 0.000 | 1.000 | 1.000 | 1.000 | 1216 |
| *Error announcement* | 0.025 | 0.155 | 0.000 | 0.000 | 0.000 | 0.000 | 1.000 | 1216 |
| *Delayed reporting* | 0.104 | 0.305 | 0.000 | 0.000 | 0.000 | 0.000 | 1.000 | 1216 |
| *Downlisting* | 0.066 | 0.248 | 0.000 | 0.000 | 0.000 | 0.000 | 1.000 | 1216 |
| *Momentum* | 0.042 | 0.370 | -2.080 | -0.145 | 0.026 | 0.209 | 2.333 | 1216 |

Panel B: Correlations

|  |  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *CMAR* | (1) | 1.000 | | | | | | | | | | | | | | |
| *Size* | (2) | 0.007 | 1.000 | | | | | | | | | | | | | |
| *ROA* | (3) | **-0.053** | **0.176** | 1.000 | | | | | | | | | | | | |
| *Sales growth* | (4) | -0.002 | -0.023 | **0.153** | 1.000 | | | | | | | | | | | |
| *Leverage* | (5) | **0.094** | **0.271** | **-0.161** | -0.041 | 1.000 | | | | | | | | | | |
| *Bid-ask spread* | (6) | 0.035 | **-0.774** | **-0.220** | -0.006 | **-0.087** | 1.000 | | | | | | | | | |
| *% zero return days* | (7) | 0.045 | **-0.426** | **-0.055** | -0.042 | 0.027 | **0.591** | 1.000 | | | | | | | | |
| *Free float* | (8) | **-0.098** | **0.095** | -0.012 | **0.055** | -0.034 | **-0.282** | **-0.239** | 1.000 | | | | | | | |
| *Individual holdings* | (9) | **0.091** | **-0.226** | 0.047 | -0.035 | -0.028 | **0.184** | **0.106** | **-0.398** | 1.000 | | | | | | |
| *Prime Standard* | (10) | -0.012 | **0.340** | **0.089** | 0.008 | -0.042 | **-0.500** | **-0.554** | **0.205** | **-0.103** | 1.000 | | | | | |
| *Voluntary IFRS adoption* | (11) | -0.017 | **0.147** | -0.024 | 0.014 | 0.032 | **-0.294** | **-0.378** | **0.205** | -0.055 | **0.383** | 1.000 | | | | |
| *Error announce-ment* | (12) | 0.046 | -0.021 | -0.038 | 0.007 | 0.035 | -0.007 | -0.012 | -0.006 | 0.032 | -0.008 | **-0.078** | 1.000 | | | |
| *Delayed reporting* | (13) | **0.068** | **-0.257** | **-0.141** | **-0.070** | 0.012 | **0.347** | **0.436** | **-0.097** | **0.121** | **-0.470** | **-0.187** | -0.037 | 1.000 | | |
| *Downlisting* | (14) | **-0.051** | **-0.091** | 0.013 | 0.004 | -0.013 | **0.223** | **0.236** | **-0.092** | -0.037 | **-0.161** | **-0.163** | 0.001 | **0.073** | 1.000 | |
| *Momentum* | (15) | -0.045 | **-0.088** | **0.112** | -0.032 | **0.069** | 0.062 | **0.052** | 0.004 | **0.058** | -0.060 | 0.032 | -0.033 | **0.068** | **-0.061** | 1.000 |

This table summarizes descriptive statistics for variables examined in Tables 3.5 and 3.6. Correlations in Panel B are confined to the full sample (Model (2) in Table 3.6). In Panel B, bold letters indicate significance at the 10% levels.

*Appendix C: Descriptive statistics for events leading to increases in requirements*

*Panel A: Descriptives*

| | Mean | Standard Deviation | Min | 25%-Quartile | Median | 75%-Quartile | Max | N |
|---|---|---|---|---|---|---|---|---|
| *CMAR* | 0.002 | 0.043 | -0.367 | -0.019 | -0.001 | 0.018 | 0.377 | 1775 |
| *CAVol* | 0.000 | 0.001 | -0.003 | 0.000 | 0.000 | 0.000 | 0.016 | 1016 |
| *Size* | 12.960 | 2.447 | 6.635 | 11.132 | 12.648 | 14.506 | 19.268 | 1775 |
| *ROA* | 0.026 | 0.151 | -0.885 | 0.015 | 0.046 | 0.074 | 0.451 | 1775 |
| *Leverage* | 0.577 | 0.272 | 0.023 | 0.409 | 0.558 | 0.725 | 1.870 | 1775 |
| *Sales growth* | 0.078 | 0.341 | -0.942 | -0.025 | 0.037 | 0.118 | 2.630 | 1775 |
| *Bid-ask spread* | -4.140 | 0.965 | -6.611 | -4.895 | -4.064 | -3.317 | -0.981 | 1775 |
| *% zero return days* | 0.064 | 0.125 | 0.000 | 0.004 | 0.012 | 0.056 | 0.824 | 1775 |
| *Free float* | 0.557 | 0.279 | 0.010 | 0.320 | 0.540 | 0.780 | 1.000 | 1775 |
| *Individual holdings* | 0.182 | 0.238 | 0.000 | 0.000 | 0.000 | 0.350 | 0.960 | 1775 |
| *Downlisting likelihood* | 0.050 | 0.071 | 0.001 | 0.014 | 0.024 | 0.061 | 0.729 | 1506 |
| *Prime Standard* | 0.748 | 0.434 | 0.000 | 0.000 | 1.000 | 1.000 | 1.000 | 1775 |
| *Voluntary IFRS adoption* | 0.663 | 0.473 | 0.000 | 0.000 | 1.000 | 1.000 | 1.000 | 1775 |
| *Error announcement* | 0.017 | 0.129 | 0.000 | 0.000 | 0.000 | 0.000 | 1.000 | 1775 |
| *Delayed reporting* | 0.108 | 0.311 | 0.000 | 0.000 | 0.000 | 0.000 | 1.000 | 1775 |
| *Momentum* | 0.099 | 0.397 | -1.765 | -0.106 | 0.057 | 0.278 | 2.950 | 1775 |

*Panel B: Correlations*

| | | *(1)* | *(2)* | *(3)* | *(4)* | *(5)* | *(6)* | *(7)* | *(8)* | *(9)* | *(10)* | *(11)* | *(12)* | *(13)* | *(14)* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *CMAR* | *(1)* | 1.000 | | | | | | | | | | | | | |
| *Size* | *(2)* | -0.020 | 1.000 | | | | | | | | | | | | |
| *ROA* | *(3)* | **-0.048** | **0.235** | 1.000 | | | | | | | | | | | |
| *Sales growth* | *(4)* | 0.023 | **-0.056** | **-0.048** | 1.000 | | | | | | | | | | |
| *Leverage* | *(5)* | 0.019 | **0.157** | **-0.217** | -0.008 | 1.000 | | | | | | | | | |
| *Bid-ask spread* | *(6)* | **0.051** | **-0.761** | **-0.204** | **0.094** | 0.017 | 1.000 | | | | | | | | |
| *% zero return days* | *(7)* | 0.024 | **-0.384** | -0.015 | **-0.039** | **0.041** | **0.530** | 1.000 | | | | | | | |
| *Free float* | *(8)* | **-0.041** | **0.134** | **-0.083** | 0.013 | **-0.091** | **-0.344** | **-0.231** | 1.000 | | | | | | |
| *Individual holdings* | *(9)* | 0.032 | **-0.259** | **0.117** | **0.071** | **0.063** | **0.224** | **0.169** | **-0.403** | 1.000 | | | | | |
| *Prime Standard* | *(10)* | -0.037 | **0.347** | **0.074** | **-0.073** | **-0.109** | **-0.492** | **-0.500** | **0.290** | **-0.162** | 1.000 | | | | |
| *Voluntary IFRS adoption* | *(11)* | -0.015 | **0.110** | **-0.055** | **-0.078** | **0.052** | **-0.229** | **-0.231** | **0.177** | 0.007 | **0.335** | 1.000 | | | |
| *Error announcement* | *(12)* | **-0.047** | 0.008 | **-0.071** | -0.021 | **0.077** | 0.026 | 0.016 | **-0.045** | **-0.053** | **-0.045** | -0.008 | 1.000 | | |
| *Delayed reporting* | *(13)* | **0.063** | **-0.296** | 0.001 | 0.004 | **0.074** | **0.329** | **0.390** | **-0.093** | **0.197** | **-0.458** | **-0.166** | -0.032 | 1.000 | |
| *Momentum* | *(14)* | 0.022 | **-0.061** | **0.120** | **0.140** | **0.075** | **0.124** | **0.050** | **-0.048** | **0.093** | **-0.124** | **-0.043** | -0.026 | **0.104** | 1.000 |

This table summarizes descriptive statistics for variables examined in Tables 3.8 and 3.9. Correlations in Panel B are confined to the full sample (Model (2) in Table 3.9). In Panel B, bold letters indicate significance at the 10% levels.

## 4   Why Do Firms Downlist? Evidence on the Costs of IFRS Compliance and Enforcement

Jörg-Markus Hitz and Stephanie Müller-Bloch[1,2]

Working Paper, Georg-August-Universität Göttingen[3]

**Abstract:** This paper investigates the role of costs associated with mandatory IFRS adoption and pertinent enforcement activities. We exploit an exogenous shock to the cost-benefit trade-offs associated with opting out of the EU-regulated market in Germany, and find that the costs of IFRS compliance and enforcement play an important role for firms' decisions to downlist, i.e., to migrate from the regulated market to unregulated segments. We exploit two particular features of our setting, the availability of error findings established by the enforcement mechanism, and the observability of market and accounting data after firms downlisted. This enables us to identify a strong enforcement effect, which on many occasions appears to be the principal driver of firms' decisions to opt out of the IFRS and enforcement mandate. Our findings shed light on the hitherto virtually unexplored costs of the EU's IAS regulation. They raise concerns about potentially restrictive costs of applying and complying with IFRS, and suggest that self-selection issues need to be addressed when investigating economic effects of mandatory IFRS adoption.

*JEL Classification:* M 48.

*Keywords:* IFRS, enforcement, bonding, going dark, downlisting.

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[2]   This study was conducted in cooperation with Jörg-Markus Hitz.

[3]   First version of the working paper: December 2014. This version: June 2016. Available at SSRN: http://ssrn.com/abstract=2533959.

## 4.1    Introduction

This paper sheds light on the potential costs for firms that have been mandated to adopt IFRS and to subject themselves to the scrutiny of enforcement institutions. Since 2005, the so-called IAS regulation requires all firms listed on regulated EU stock market segments to prepare consolidated accounts in accordance with IFRS (with a few exceptions). Also, the regulation mandates member states to set up institutions charged with the enforcement of accounting standards, to ensure an even level of compliance with IFRS across member states. Numerous academic studies have documented various positive effects of this 'IFRS experiment', in particular significant positive capital market outcomes such as increases in liquidity (for an overview, see e.g., Brüggemann et al. 2013). Also, recent evidence by Christensen et al. (2013) finds that the mandated strengthening of enforcement quality likely played an important role in generating or facilitating the observed positive liquidity effects upon IFRS adoption in the EU. In contrast to this abundant evidence of positive economic effects, far less is known about the costs of the IAS regulation, on the firm-level, and for economies as a whole. One likely reason for this lack of pertinent research is the scarcity of information and data on IFRS-related cost of compliance and enforcement.

Our paper adds to the literature of IFRS-related cost of compliance and enforcement by exploiting one specific EU setting, Germany, whose features and data availability allow for the identification of said costs. For one thing, the German system is quite transparent with respect to the activities of enforcement institutions. The main sanctioning device is 'adverse disclosure', i.e., firms that have been found to publish erroneous financial statements are mandated to disclose error findings established by the enforcement institutions (Hitz et al. 2012). This market-based 'name and shame' approach to enforcement enables us to identify firms which have been investigated and censured by enforcement institutions and therefore have on average incurred substantial costs of enforcement. Also, these enforcement announcements give a detailed account of the error findings and hence allow for an assessment of error severity. The second feature we exploit is a recent alteration to the listing requirements. Since 2009, authoritative court rulings in Germany have substantially lowered the legal threshold for firms to downlist, i.e., to migrate from the EU-regulated market to a private, exchange-regulated market. While downlisting requirements were almost prohibitively restrictive prior to 2009, the revised legal interpretation substantially reduces the costs for firms to, in essence, opt out of both the IFRS mandate, and enforcement supervision. Hence, these recent court

rulings delivered an exogenous shock to firm-level cost benefit trade-offs of their listing status. As a third feature, downlisting firms stay listed on a public stock exchange, and also remain subject to disclosure regulation, including filing requirements. This enables us to investigate firm-level accounting and market outcomes after the downlisting, to discern more effectively enforcement related from IFRS-compliance related downlisting motives.

We shed light on the cost-benefit trade-offs associated with mandatory IFRS application and enforcement scrutiny using a determinants model and two sets of supplementary analyses. In our main analysis, we investigate determinants associated with the likelihood of firms to opt out of the regulated market. Effectively, we document the particular characteristics of firms likely to downlist, identifying factors that may tip the cost-benefit trade-off of being listed in the regulated market. Our analyses are based on a sample of all firms that announced their intent to downlist during the 2009-2014 period. We find evidence consistent with IFRS compliance and enforcement related cost representing significant determinants of firms' decisions to opt out of the regulated market. Accordingly, the likelihood for firms to opt out of the IFRS and enforcement mandate is negatively associated with firm size and profitability, and increases for firms that were censured by the enforcement mechanism, in particular for firms with severe accounting errors. In contrast, opt out likelihood is reduced as transparency benefits such as liquidity increase. These findings suggest that despite the benefits that prior literature has documented, the pertinent costs of the IFRS mandate may be restrictively high for a substantial number of firms.

In our first supplementary analysis, we investigate market reactions to firms' first-time announcements of their intent to downlist. Stock price reactions should be indicative of whether shareholders regard the downlisting decision as value enhancing, or not. The results from our event study analysis document large variation in market price reactions. Analyses of the determinants of market reactions unveil a positive association for firms that credibly pursue cost reductions, given their prior commitment to transparency. On the other hand, the market penalizes downlisting announcements by firms that very previously were censured by the enforcement mechanism, in particular if material errors were established. This finding may indicate that investors suspect managerial intent to intentionally dodge transparency requirements and enforcement oversight. However, as

our findings also indicate that downlisting announcements unveil unfavorable firm prospects per se, inferences from this event study are limited.

Our second supplementary analysis investigates market and accounting characteristics of firms after their downlisting. Findings demonstrate that more than half of the firms that downlisted before 2013 opted to continue reporting under IFRS on a voluntary basis. Compared to a sample of matched firms that retained their listing in the regulated market, downlisting firms after migrating to the open market experienced slight decreases in size, liquidity, and in audit fees.

Taken together, our analyses reveal that for some firms that have originally been subject to the IFRS mandate, pertinent costs of compliance and enforcement have been substantial, and appear to outweigh IFRS-related transparency benefits. Combining the determinants model with the post-downlisting analysis suggests that the costs of being subjected to the scrutiny of the German enforcement mechanisms represent a particularly important factor. These findings are important because they cast light on a phenomenon that has so far received little attention in the literature – the systematic opt out of firms from the IFRS compliance and enforcement regime. We investigate these downlisting decisions to contribute a cost perspective to the IFRS literature, effectively identifying what may represent "unintended consequences" of IFRS adoption from a regulatory perspective (Brüggemann et al. 2013). This evidence of presumably restrictive compliance costs is of potential relevance for the IASB's approach to standard setting, but also for the regulatory assessment of IFRS-related net benefits, e.g., as part of the EU Commission's ongoing efforts to evaluate the IAS regulation and related network benefits. Also, our findings indicate potential self-selection problems in studies that investigate implications or economic effects of the IFRS mandate, because systematic opt outs from this mandate may bias samples towards the very firms that likely benefit from increased transparency and enforcement.

Our paper contributes to two literature streams. First, we contribute to the literature on the costs and benefits of the IFRS mandate. In particular, we augment the literature on economic effects of IFRS enforcement, showing that enforcement action creates potentially substantial costs that may outweigh the benefits of being listed in a highly regulated market. Hence, we supplement prior evidence on the economic effects of enforcement action in Germany (Hitz et al. 2012), and cross-country evidence by Christensen et al. (2013) on positive liquidity effects of IFRS and enforcement, by shedding light on

pertinent costs. Also, we complement evidence in particular by Fiechter et al. (2016), who demonstrate for the Swiss environment that IFRS related costs likely drive firms' decisions to opt out of specific stock market segments. However, other than these papers, our setting allows us to identify a "pure" enforcement effect, showing that enforcement related costs represent a decisive factor for opt out decisions.

The remainder of the paper is as follows. In section 4.2, we outline details of the institutional setting in Germany, and place our paper within the pertinent literature. Sections 4.3 to 4.5, respectively, outline the methodology and present the findings for the determinants model, the event study, and the post-downlisting analyses. Section 4.6 provides a discussion of our findings, and section 4.7 concludes.

## 4.2 Background

### 4.2.1 Disclosure and securities markets regulation in Germany

*Mandatory IFRS adoption and enforcement*

Since 2005, Regulation (EC) No. 1606/2002 mandates all firms listed on a regulated European stock market segment to prepare consolidated accounts in accordance with IFRS (with a few exceptions). Par. 16 of this so called 'IFRS-regulation' also requires member states to "take appropriate measures to ensure compliance with international accounting standards", i.e., to install effective mechanisms for the enforcement of IFRS accounting standards. This mandate was formalized in the Transparency Directive in 2004. The coordination of European enforcement activities was delegated to CESR, which was succeeded by the European securities regulator ESMA in 2011.

Germany followed this legal mandate in 2004 by adopting legislation that established an external enforcement mechanism organized in two tiers, combining the Financial Reporting Enforcement Panel (FREP) as a private body, and the German securities regulator (BaFin) as a federal public agency. This mechanism has been in operation since mid-2005. The FREP conducts reviews of the financial reports of firms listed on a regulated market segment, based on a proactive sampling approach (about 85 percent of investigations), but also upon indication (about 5 percent of investigations), and upon specific request from the securities regulator (about 10 percent of investigations). From the annual reports of the FREP it can be gleaned that roughly 20 percent of the investigations that had been concluded by the end of 2014 resulted in an error finding. Once the FREP

establishes materially erroneous financial statements, the case is referred to the securities regulator BaFin, who will order the firm to disclose the error finding. In cases where a firm does not concur with the FREP's error findings, BaFin will undertake an investigation of its own and, if the error finding prevails, enforce disclosure. Disclosure of error findings established by FREP or BaFin hence represents the principal sanctioning device. This 'name and shame' mechanism of adverse disclosure is thus reflective of a market-based approach to enforcement, where market participants are duly informed about financial reporting irregularities, and may act on this information, e.g., by selling the stock, or by attempting to enact governance changes (Hitz et al. 2012).

*The stock exchange landscape: EU-regulated market vs. open markets*

The stock exchange landscape in Germany comprises the EU-regulated market and the so-called open market, which comprises securities markets administered and regulated by the respective stock exchanges only. Apart from the most important and most visible stock exchange, the Frankfurt Stock Exchange (FSE), there are six other regional stock exchanges: Munich, Stuttgart, Hamburg, Hanover, Dusseldorf, and Berlin. In addition to the EU-regulated market, each of these stock exchanges runs at least one exchange-regulated market segment.

Characteristically, reporting and compliance requirements are more numerous for firms that list in the EU-regulated market. In particular, the mandate to prepare IFRS group accounts and to subject financial reporting to the reviews of the German enforcement mechanism only applies to firms in the EU-regulated market. Hence, firms listed in the open market are mandated to prepare their annual financial statements based on German GAAP, which is deemed to be less informative given the importance of the prudence principle, and the comparatively small amount of notes disclosures. However, firms listed in the open market may elect to voluntarily prepare IFRS group accounts instead.

In addition, for firms in the EU-regulated market, the securities act and the commercial code stipulate a number of other compliance requirements, which do not (fully) apply for firms listed in the open market.[4] By way of example, Appendix A gives a detailed account of respective legal requirements for firms listed on the FSE. These requirements

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[4]    Note however that supplementary to this legal framework, the respective stock exchanges are free to introduce additional listing requirements for firms to be listed in the respective open market segments.

are to a large extent similar to those imposed by the six regional exchanges. In a nutshell, firms listed in the EU-regulated market are subject to more extensive periodic reporting requirements, including a report on Corporate Governance Code compliance, interim-annual financial statements, quarterly interim reporting (until 2016), directors' dealings, and the requirement to divulge to the market any material information, e.g., on mergers and acquisitions or other major economic incidents, on an 'ad hoc' announcement basis. In contrast, open market firms are subject to semi-annual reporting only, and to a weaker form of ad hoc disclosures. Also, filing periods are more generous, as firms in the regulated market must file their annual (semi-annual) financial statements within three (two) months after fiscal year end, whereas these filing periods extend to six (four) months for firms in the open market. Plus, while firms in the EU-regulated market invariably are required to fully disclose the respective financial statements, firms in the open market, depending on size, may only disclose condensed reports.

Taken together, legal reporting and compliance requirements are more comprehensive and strict for firms listed in the EU-regulated market, compared to firms listed in the open market. Hence, being listed in the open market entails providing fewer information on a less timely basis, quite likely at substantially lower cost.

*Legal requirements for downlistings from the EU-regulated to the open market*

Par. 39 of the German stock market act allows for firms to downlist from the EU-regulated market to an open market segment on the condition that investors (stockholders) are not negatively affected. As the stock market act provides no further clarification of this requirement, it has been up to the courts to provide guidance. To that end, the influential 2002 "Macrotron" ruling by the German Federal Court of Justice (BGH) stipulated that a listing on the EU-regulated market could only be revoked if two conditions were met, (1) a majority vote of the shareholders' meeting in support of the delisting / downlisting decision, and (2) a mandatory cash offer to minority shareholders to buy back their stock, at a "reasonable" price which must equal at least the current market price. While the Macrotron case referred to a delisting decision, the court made it clear that these principles were also applicable to downlistings. Hence, the then legal requirements for an opt out of the regulated market set high cost obstacles, as campaigning for a majority vote of shareholders represents a cumbersome and risky venture, in particular given the high costs involved in buying out minimum shareholders (e.g.,

Holzborn and Hilpert 2010). Consistent with these costs involved being prohibitive in nature, opt outs from the regulated market effectively did not take place at that time.

As the various stock exchanges in Germany gradually developed their respective exchange-regulated open market segments from 2005 onwards,[5] a series of court rulings followed which, by April 2009, gradually modified and revoked the Macrotron principles (Appendix B). At the core, these rulings established that the Macrotron principles were not applicable to downlistings, as the migration from one market to another would not negatively affect stockholders. In July 2012, this legal interpretation was ultimately confirmed by the German Constitutional Court (BVerfG), who held that the liquidity of a stock did not constitute a property right of equity owners. Adopting this view, in October 2013, the "Macrotron" principles were finally revoked both for downlistings and for delistings by the highest court, the German Federal Court of Justice (BGH), with its "FRoSTA" decision.

In summary, in April 2009, the Macrotron principles were quite suddenly removed for firms migrating to the exchange-regulated market (Holzborn and Hilpert 2010). As a result, executive and supervisory board members were now able to revoke the listing in the EU-regulated market solely based on a board decision. The new ruling therefore represented an exogenous shock to individual firms' trade-offs of costs and benefits of being listed in the regulated market, effectively lowering the threshold for an opt out from the regulated market. Consistent with this, Panel A of Table 4.1 documents that in the three years from 2006 to 2008, only four firms in total announced their intent to move from the regulated market to the open market, whereas this number rose markedly during the following years, with 24 firms in 2009 alone, and a total of 118 firms over the period 2009 – 2014. Only briefly afterwards, on October 1, 2015, the German legislator, pressurized in particular by representatives of minority shareholders, revised the stock market act to introduce downlisting and delisting criteria essentially equal to the former Macrotron principles, effectively raising the threshold for opt outs to the pre 2009 level.

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[5]    Appendix A gives a detailed comparison of reporting and compliance requirements for the regulated market and for the exchange-regulated market at Germany's main stock exchange, Frankfurt. Note however that requirements for the exchange-regulated market vary somewhat for other stock exchanges in Germany.

**Table 4.1:** Sample selection

*Panel A: Distribution of downlistings from 2005 to 2014*

| Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Number of firms in the EU-regulated market (as of July 1) | 1,235 | 1,122 | 1,074 | 1,030 | 966 | 915 | 873 | 825 | 751 | 756 | |
| Change in the number of firms in the EU-regulated market (as of July 1) | | -113 | -48 | -44 | -64 | -51 | -42 | -48 | -74 | 5 | -479 |
| Number of announcements | | 1 | 1 | 2 | 24 | 22 | 17 | 22 | 10 | 23 | 122 |
| Number of migrations | | 1 | 0 | 1 | 21 | 21 | 13 | 23 | 12 | 11 | 103 |

*Panel B: Sample selection of downlisting firms for determinants model*

| | Year | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Total |
|---|---|---|---|---|---|---|---|---|
| | Number of announcements | 24 | 22 | 17 | 22 | 10 | 23 | 118 |
| ./. | Missing data | 5 | 6 | 2 | 2 | 1 | 7 | 23 |
| ./. | Banks | 1 | 1 | 1 | 3 | 0 | 0 | 6 |
| ./. | Partnership limited by shares | 2 | 1 | 1 | 2 | 0 | 0 | 6 |
| ./. | No IFRS | 4 | 0 | 1 | 1 | 1 | 3 | 10 |
| = | **Sample I (Determinants model)** | **12** | **14** | **12** | **14** | **8** | **13** | **73** |

*Panel C: Control Sample Determinants Model*

| | | N (obs.) | N (firms) |
|---|---|---|---|
| | **Firms continously subjected to enforcement by FREP / BaFin (2008 to 2014)** | **2,622** | **437** |
| ./. | Banks | 156 | 26 |
| ./. | Missing data | 399 | 49 |
| ./. | No IFRS | 119 | 17 |
| ./. | Partnership limited by shares | 53 | 9 |
| ./. | Balanced panel | 221 | 57 |
| = | **Control sample determinants model** | **1,674** | **279** |
| + | **Downlisting sample determinants model (Sample I)** | **73** | **73** |
| = | **Total sample determinants model** | **1,747** | **352** |

*Panel D: Sample selection of downlisting firms for event study*

| | Year | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Total |
|---|---|---|---|---|---|---|---|---|
| | Sample I (Determinants model) | 12 | 14 | 12 | 14 | 8 | 13 | 73 |
| + | Non-missing data | 2 | 1 | 0 | 0 | 2 | 1 | 6 |
| ./. | Missing data | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| ./. | Confounding events | 2 | 2 | 0 | 3 | 0 | 2 | 9 |
| ./. | % zero return days > 75% | 0 | 1 | 1 | 2 | 0 | 1 | 5 |
| = | **Sample II (Event study)** | **12** | **12** | **10** | **9** | **10** | **11** | **64** |

*Panel E: Sample selection of downlisting firms for post downlisting analysis*

| | Year | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Total |
|---|---|---|---|---|---|---|---|---|
| | Sample I (Determinants model) | 12 | 14 | 12 | 14 | 8 | 13 | 73 |
| ./. | Downlisting date unknown | 1 | 0 | 0 | 1 | 2 | 4 | 8 |
| ./. | Downlisting after fiscal year end 2013 | 0 | 0 | 0 | 0 | 3 | 9 | 12 |
| ./. | Missing data | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| ./. | Balanced panel | 3 | 1 | 3 | 5 | 1 | 0 | 13 |
| = | **Sample III (Post downlisting analysis)** | **7** | **13** | **9** | **8** | **2** | **0** | **39** |

Panel A summarizes the distribution of downlisting announcements of German firms from 2009 to 2014. The number of firms in the EU-regulated market is obtained from data provided by BaFin. Ad hoc announcements on firms' intent to downlist are obtained from LexisNexis. In the total number of migrations to the open market, five firms are missing since the exact migration date could not be identified, four firms are missing because they did not downlist, and ten firms have a migration date set for 2015. Panel B and C display the sample selection process for the determinants model. Panel D summarizes the sample selection process for the event study. Confounding events are events such as earnings announcements or financing transactions that occur on the same day as the downlisting announcement. Panel E summarizes the sample selection process for the post downlisting analysis. Data is obtained from Thomson Reuters Datastream.

## 4.2.2 Prior literature

By examining firms' downlisting decisions to investigate the cost-benefit trade-offs associated with IFRS reporting and enforcement, our paper contributes to two literature streams. First, we contribute to the literature on the economic effects of IFRS enforcement by addressing pertinent costs, and whether and how these costs are sufficiently substantial to outweigh the benefits of the IFRS mandate. Hence, we augment prior country-level evidence on the economic effects of enforcement action in Germany by Hitz et al. (2012), who, consistent with a potential sanctioning effect of the 'name and shame' mechanism, document significant market value discounts upon the disclosure of accounting errors by the two-tier enforcement mechanism. Also, Hitz et al. (2012) document that the size of the stock market penalty increases with the severity of error findings. Consistent with these results, Ernstberger et al. (2012) provide evidence that earnings management decreases and stock liquidity and market valuation increases for firms that are subject to the new enforcement regime and concurrently installed audit oversight procedures. These country-level studies for Germany are in line with cross-country evidence, in particular by Christensen et al. (2013). These authors demonstrate that the positive liquidity effects in European markets after 2005, which earlier studies mostly attributed to the mandatory adoption of IFRS (e.g., Daske et al. 2008), materialize significantly only in those five jurisdictions (one of them being Germany) which introduced enforcement mechanisms based on random reviews concurrent with the IFRS adoption in 2005.

We contribute to the literature on the economic effects of enforcement of IFRS by focusing on enforcement-related costs. Therefore, we are able to identify potential side effects and costs of the IFRS and enforcement mandates, which are not captured in prior studies that investigate market outcomes. Also, other than Christensen et al. (2013) who are ultimately unable to disentangle effects from the IFRS mandate and effects from enforcement activities, our setting allows for better identification of enforcement related costs. This owes to the detailed nature of published enforcement announcements, and to the fact that we are able to identify firms that solely opted out of the enforcement mandate, while choosing to continue preparing IFRS financial statements after the downlisting.

Second, we contribute to the stream of literature that examines drivers and consequences of firms' decisions to select into or out of specific listing requirements that entail

specific compliance costs. For example, Leuz et al. (2008) find that the introduction of SOX lead to significant increases in the number of firms that deregister with the SEC and move to the open market (i.e., "go dark"). Firms experienced a negative market reaction when the intent to go dark was announced, and, compared to a control group, were small, had weak stock performance, higher leverage, small asset growth, and were incorporated in federal states with little disclosure regulation. Our setting is similar to Leuz et al. (2008) to the extent that we are able to investigate regulation-induced decisions of firms to opt out of specific stock market listings. Yet, while Leuz et al. (2008) investigate firms that completely dispensed with reporting requirements, firms in our setting continue filing reports. Therefore, we are able to observe accounting and market data after the actual downlisting took place. This makes our paper similar to the contemporaneous paper by Fiechter et al. (2016), who examine a small sample of 34 listed Swiss firms that switched from IFRS to Swiss GAAP. The authors find that these firms are small, have higher inside ownership, and fewer foreign investors. The authors also examine the economic consequences of switching to Swiss GAAP and do find evidence of decreases in liquidity following the switch for firms with dispersed ownership. Our paper resembles Fiechter et al. (2016) to the extent that we also investigate decisions to opt out of IFRS. However, we go further because our setting enables us to adopt an identification strategy that isolates the incremental role of enforcement related costs.

## 4.3 Determinants of the downlisting decision

We conduct three sets of analyses. In our main analysis, we explore the determinants of firms' opt out decisions to infer whether specific IFRS and enforcement related factors are conducive to the downlisting decision. In our supplemental analyses, we first investigate market reactions to firms' first time announcement of their intent to downlist, and discuss to what extent these are in line with the determinants analysis. Second, we analyze accounting and market data of firms after their downlisting, to investigate reporting choices and to identify potential motives and implications of the downlisting decisions.

### 4.3.1 Theoretical background

To infer whether cost of IFRS compliance and enforcement play a role in firm-level decisions to downlist, we identify sets of factors that we hypothesize to shape these decisions, and estimate a determinants model. At the outset, we compiled the reasons that downlisting firms stated. To that end, we conducted an exploratory content analysis of

the ad hoc announcements released by firms to divulge to the market their intent to migrate to the exchange-regulated market. Out of the total sample of 118 downlisting firms during the 2009-2014 period, 92 firms (78.0 percent) in their announcement explicitly stated one or more reasons for their decision (see Appendix C). The three categories of objectives most frequently quoted were (1) to dispense with the cost of being listed in the EU-regulated market (48 out of 92 firms, 52.2 percent), (2) to reduce administrative costs of reporting and compliance (42 out of 92 firms, 45.7 percent), and, quite related to (1) and (2), (3) to improve the cost-benefit ratio of the stock market listing (30 out of 92 firms, 32.6 percent).

The stated reasoning of downlisting firms is consistent with the cost savings hypothesis, which predicts that firm managers rationally trade off costs and benefits of being listed in the EU-regulated market in order to maximize firm value. However, this hypothesis rests on the notion that managers are well-governed and act in the interest of shareholders. The alternative agency hypothesis holds that this is not the case, and predicts that managers maximize their personal welfare, potentially at the cost of shareholders. If this is the case, managers may decide to downlist despite a favorable cost-benefit trade-off of being listed in the EU-regulated market, to improve their personal welfare. This may be the case because the downlisting reduces transparency and dispenses with enforcement scrutiny, hence increasing managers' leeway to extract private control benefits, such as excessive remuneration / pay without performance, or various perks, or by shirking on the job (Leuz et al. 2008). Combining both theories, we arrive at the empirical prediction that the likelihood for firms to migrate from the regulated market to the open market is positively associated with reporting and compliance costs, with enforcement cost, and with managerial opportunism, and negatively associated with transparency benefits.

### 4.3.2 Research design

Our predictions are incorporated into Equation (1), which captures determinants of the likelihood of a firm i's decision to downlist for a given fiscal year t:

(1)     *Prob (Downlisting announcement$_{it}$) = Reporting and compliance costs$_{it}$ + Costs*

*of enforcement$_{it}$ + Transparency benefits$_{it}$ + $\sum$ Controls$_{it}$ + $\sum$ Fixed effects$_{it}$ + ε*

In line with our theoretical background, we identify three vectors of test variables, and supplement the model by a range of control variables and controls for fixed effects. As we are interested in particular in the trade-off of IFRS compliance and enforcement related costs and benefits, we treat managerial opportunism as a control variable.

*Reporting and compliance costs.* If managers rationally trade off the cost and benefits of being listed in the EU-regulated market, then this trade-off is more likely to become unfavorable as relative reporting and compliance costs increase. Since compliance costs are not directly observable, we use firm size as a construct that is likely associated with these costs. Because a substantial portion of reporting and compliance costs is not proportionally related to size, e.g., fractions of costs of building up and maintaining IFRS expertise, and some costs of preparing IFRS accounts and having them audited, we assume that relative IFRS compliance costs decrease with firm size. As a second indicator, we use firm profitability. Hence, we assume that as profitability declines, the perceived costs related to IFRS compliance and enforcement increase, as the firm runs the danger of missing earnings benchmarks, breaching covenants, or running into financial distress. In line with Leuz et al. (2008) and Fiechter et al. (2016), we measure *Size* as the natural logarithm of total assets, and profitability as *ROA* (i.e., net income plus interest expense divided by mean total assets).

*Costs of enforcement.* Being under the auspices of an enforcement institution involves an additional set of specific benefits and cost. On the benefits side, being subject to a strict enforcement regime potentially increases the (perceived) quality of financial statements, which in turn facilitates market benefits such as lower cost of capital and higher liquidity. This ever more so as firms, by effectively choosing to be listed in the regulated market, self-select into the enforcement regime, thus signaling their commitment to high financial reporting quality. This is consistent with the so-called 'bonding hypothesis', according to which managers voluntarily subject the firm to strong enforcement oversight in order to create more favorable financings terms (Doidge et al. 2010). At the same time, being subject to enforcement oversight creates various costs. These involve direct costs, in particular if a firm is subject to an investigation and needs to commit resources to communicating with the enforcer. These costs would typically also include additional fees to the auditors. More importantly, potentially significant costs materialize in case of an error finding by the enforcer. As noted, Hitz et al. (2012)

document that firms are penalized on the occasion of such error announcements, and that the market value discount is positively associated with the severity of the errors.

While the benefits of enforcement activities are hard to discern, the German setting allows us to identify firms that have faced potentially high costs of enforcement, i.e., firms that have been censured publicly for erroneous accounting. We assume that for these firms, costs of enforcement are c.p. higher than for non-censured firms. Hence, for our empirical analyses, we measure costs of enforcement using the binary variable *Error announcement*, which takes the value of one for firms that were mandated to publish an error announcement following an investigation by FREP / BaFin in the past fiscal year, and zero otherwise. Second, as a more detailed measure, we introduce error severity, and divide the sample of error firms into firms that faced potentially high costs of enforcement (*High error severity*), and those that did not (*Low error severity*). Consistent with the Hitz et al. (2012) findings, we exploit the detailed account of error findings that the German enforcement mechanism mandates to be published, and tie error severity to the amount of material accounting errors by categorizing as high error severity those error announcements that included two or more accounting errors with a direct impact on net income.

*Transparency benefits.* Benefits of high quality financial reporting include increases in liquidity, and reductions in cost of equity and debt financing. Firms differ to the extent that IFRS enables them to create these benefits, and to the extent that they are able to exploit them. We use two constructs to capture transparency benefits. Our first measure, liquidity, represents both an outcome and an indicator of transparency. We measure liquidity using two variables: *Bid-ask spread* and *% of zero return days*. *Bid-ask spread* is measured as the natural logarithm of the mid-point scaled median bid-ask spread (Christensen et al. 2013) over the past fiscal year, *% of zero return days* is the percentage of zero return days during the past fiscal year. Our second measure of transparency benefits is whether firms adopted IFRS prior to the mandate in 2005. An exhaustive literature demonstrates that such 'voluntary adopters' are specific firms with a relatively high level of transparency and hence a well-developed information environment (Soderstrom and Sun 2007). Therefore, firms voluntarily adopted IFRS because of expected net benefits from transparency. To the extent that these benefits persist, we expect voluntary adopters to be less likely to opt out of the IFRS regime. In our empirical analysis, we include the binary variable *Voluntary IFRS adoption*, which takes the value

of one for firms which voluntarily applied IFRS or US-GAAP prior to 2005, and zero otherwise.

We add to our model various control variables that prior literature has shown to have an impact on a firms' decision to voluntarily decrease disclosure. Panel A of Table 4.2 details the definitions and calculations of these control variables, and of our main test variables. To control for managerial opportunism, we include *Discretionary accruals*, which as a measure of earnings management has been shown to be associated with managerial opportunism (Walker 2013). As further controls, we include *Sales growth* as proxy for a firm's financing needs (e.g., Fernandes et al. 2010, Doidge et al. 2010). Following Fiechter et al. (2016), we include *Leverage* as a measure of financing constraints, and *Past return* (i.e., stock return over the past year) to control for a firm's past year performance. *Free float* is included to control for a firm's ownership concentration (e.g., Fiechter et al. 2016). In addition, we also control for firms being listed on the FSE. As noted FSE is the most important and visible stock exchange in Germany and compromises 90.3% of our sample observations. Firms listed on the FSE are likely to differ from firms listed on the less visible regional stock exchanges. Finally, we use industry- and year-fixed effects and cluster standard errors by firm (e.g., Doidge et al. 2010).

**Table 4.2:**     Variables measurement

*Panel A: Determinants model and downlisting analysis*

| *Variable name* | *Definition* |
|---|---|
| *Downlisting announcement* | Binary variable indicating that a firm announced its intent to downlist in the respective year |
| *Size* | Natural logarithm of total assets at the beginning of the year[1] |
| *ROA* | Return on assets (i.e., net income plus interest expense divided by mean total assets) at the beginning of the year[1] |
| *Error announcement* | Binary variable indicating that a firm had to publish an error announcement in the past fiscal year |
| *High error severity* | Binary variable indicating that a firm had to publish an error announcement following an erroneous financial report with more than one error that affected net income in the past fiscal year |
| *Low error severity* | Binary variable indicating that a firm had to publish an error announcement following an erroneous financial report with no more than one error that affected net income in the past fiscal year |
| *Bid-ask spread* | Natural logarithm of median bid-ask spread over the past year (i.e., price ask minus price bid divided by price bid plus half the difference between price ask and price bid) |
| *% zero return days* | Percentage of zero return days in the past fiscal year |
| *Voluntary IFRS adoption* | Binary variable indicating that a firm voluntarily adopted IFRS or US-GAAP prior to 2005 |
| *Discretionary accruals* | Absolute discretionary accruals derived from Jones model based on total accruals without growth and ROA adjustment (Kothari et al. 2005) at the beginning of the year |
| *Sales growth* | Two-year average of sales growth at the beginning of the year[1] |
| *Leverage* | Total assets less common equity divided by total assets at the beginning of the year |
| *Past return* | Stock return over the past year[1] |
| *Free float* | Percentage of free float shares measured at the beginning of the year |
| *Audit fees* | Natural logarithm of auditing fees in the past fiscal year |

*Panel B: Event study*

| *Variable name* | *Definition* |
|---|---|
| *CMARs* | Three-day market adjusted returns [-1;1] relative to the CDAX around the announcement date of downlisting |
| *Voluntary IFRS adoption* | Binary variable indicating that a firm voluntarily adopted IFRS or US-GAAP prior to 2005 |
| *Bid-ask spread* | Natural logarithm of median bid-ask spread over the past year (i.e., price ask minus price bid divided by price bid plus half the difference between price ask and price bid) |
| *Error announcement* | Binary variable indicating that a firm already had to publish an error announcement |
| *High error severity* | Binary variable indicating that a firm already had to publish an error announcement following an erroneous financial report with more than one error that affected net income |
| *Low error severity* | Binary variable indicating that a firm already had to publish an error announcement following an erroneous financial report with no more than one error that affected net income |
| *ROA* | Return on assets (i.e., net income plus interest expense divided by mean total assets) at the beginning of the year[1] |
| *Future ROA* | Return on assets (i.e., net income plus interest expense divided by mean total assets) at the end of the year[1] |
| *Market capitalization* | Natural logarithm of market capitalization prior to the downlisting announcement |
| *Free float* | Percentage of free float shares on the day of the downlisting announcement |

This table summarizes the variables used in this paper.

[1] Variables are winsorized at the 1% and 99% level.

*4.3.3   Sample selection*

To identify firms that discontinued the listing of their stocks in German EU-regulated markets and moved to German exchange-regulated market segments, we searched LexisNexis for ad hoc announcements using the terms "change" and "open market".[6] A change in listing status is a corporate event that must be reported immediately to the investment public via ad hoc announcements, because of the likely impact on firm / stock value. After removing foreign firms, we identify 118 firms that announced their intent to move their stocks to the open market during 2009 to 2014. We limit our sample observation period to the years 2009 to 2014 because, as outlined in section 4.2.1, there were essentially prohibitive barriers to downlistings prior to 2009.

The sample selection process for the determinants analysis is summarized in Panel B of Table 4.1. We exclude 23 firms due to missing data, six banks, six firms with specific liability and ownership structures (partnerships limited by shares ), and ten firms that do not prepare consolidated financial statements and were hence not subject to the IFRS mandate ("no IFRS"). This yields a final sample of 73 downlisting observations (Sample I), which we compare to a control sample of firm-year observations of firms that decided not to downlist during the sample period (Panel C of Table 4.1). This control sample compromises a balanced panel of all firms continuously subjected to enforcement by FREP / BaFin from July 2008 to July 2014 with stocks listed on regulated German stock markets. From the initial sample of 2,622 firm-year observations, we exclude 156 firm-year observations for financial institutions, 399 firm-year observations due to missing data, 53 firm-year observations for partnerships limited by shares, 119 firm-year observations for firms that did not prepare consolidated financial statements, and 221 firm-year observations to construct a balanced panel structure. This results in a final control sample of 1,674 firm-year observations and a total sample of 1,747 firm-year observations for the determinants model. For all analyses, data on market prices, bid-ask spreads, free float, and balance sheet data is obtained from Thomson Reuters Datastream. Data on FREP / BaFin error announcements is hand-collected from the Federal Gazette (www.bundesanzeiger.de).

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[6]    „Wechsel" and „Freiverkehr".

*4.3.4   Empirical findings*

Table 4.3 reports descriptive statistics (including correlations) for the variables used to estimate the determinants model, separately for the downlisting firms, and for the control sample of continuously listed firms. It follows from the data that, on average, firms that announce their intent to downlist are significantly smaller than the firms that remain in the EU-regulated market. Also, these firms are significantly less liquid in terms of both our measures for liquidity (*Bid-ask spread*, *% zero return days*). Firms that voluntarily adopted IFRS or US-GAAP prior to 2005 appear to be less likely to downlist, while firms that were subject to enforcement action in the last year cluster more strongly in the downlisting sample (*Error announcement*), in particular firms with more severe error findings (*High error severity*). Taken together, the differences in our test variables are all consistent with our empirical predictions that costs and benefits of IFRS compliance and enforcement are important factors in shaping firms' opt out decisions.

Panel A of Table 4.4 reports the results of estimating our determinants model. We estimate a total of five different specifications of Equation (1). Models (1), (2), and (3) are estimated for the full sample. Models (4) and (5) are estimated for a subsample of firm year observations, owing to data limitations imposed by the calculation of the control variable *Discretionary accruals*.

For our full sample analyses (models (1), (2), (3)), coefficient estimates for the variables *Size* and *ROA* turn out negative and significant. This indicates that smaller firms and less profitable firms are more likely to opt out of the regulated market, consistent with our prediction that firms opt out of the regulated market because of substantial costs of applying and complying with IFRS. Analysis of economic effects for model (1) shows that a one standard deviation increase in *Size* (*ROA*) reduces the likelihood of downlisting by 21.9% (13.1 %).[7]

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[7]   We also re-estimate model (1) for a reduced sample in order to include ad hoc announcements as a proxy for non-IFRS disclosure costs, i.e., disclosure costs that result from the listing in the EU-regulated market irrespective of the application of IFRS. The reduction in sample size results from data limitations since the number of ad hoc announcements is available only for a subsample of firms. We find that the number of ad hoc announcements in the past fiscal year, as a proxy for non-IFRS disclosure costs, does not significantly affect a firm's decision to downlist. Further, we re-estimate models (1) and (2) including *Future ROA*, i.e., return on assets at the end of the year to control for poor future prospects. We find that the coefficient on *Future ROA* is significantly negative (5% level) when excluding *ROA* from the model. While this might point to poor future prospects being a driver of downlisting decisions, the finding might also be attributable to the high correlation of *ROA* and *Future ROA*.

**Table 4.3:**     Descriptives of determinants of firms' decisions to downlist

*Panel A: Descriptives*

| *Variables* | Downlisting sample | | Control sample | | Difference | t-value | Wilkoxon z-value |
|---|---|---|---|---|---|---|---|
| | mean | N | mean | N | | | |
| *Size* | 11.354 | 73 | 12.822 | 1,674 | -1.469 | (-5.40)*** | (-5.40)*** |
| *ROA* | -0.031 | 73 | 0.033 | 1,674 | -0.064 | (-4.10)*** | (-5.29)*** |
| *Error announcement* | 0.082 | 73 | 0.028 | 1,674 | 0.054 | (2.64)*** | (2.64)*** |
| *High error severity* | 0.041 | 73 | 0.004 | 1,674 | 0.037 | (4.11)*** | (4.09)*** |
| *Low error severity* | 0.041 | 73 | 0.024 | 1,674 | 0.017 | (0.93) | (0.93) |
| *Bid-ask spread* | -3.135 | 73 | -4.011 | 1,674 | 0.876 | (7.10)*** | (7.34)*** |
| *% zero return days* | 0.283 | 73 | 0.112 | 1,674 | 0.171 | (8.35)*** | (7.53)*** |
| *Voluntary IFRS adoption* | 0.397 | 73 | 0.670 | 1,674 | -0.273 | (-4.85)*** | (-4.81)*** |
| *Discretionary accruals* | 0.068 | 49 | 0.049 | 966 | 0.019 | (2.68)*** | (1.91)* |
| *Sales growth* | 0.040 | 73 | 0.106 | 1,674 | -0.066 | (-1.45) | (-3.50)*** |
| *Leverage* | 0.582 | 73 | 0.582 | 1,674 | 0.000 | (0.01) | (0.41) |
| *Past return* | 0.124 | 73 | 0.150 | 1,674 | -0.027 | (-0.50) | (-0.94) |
| *Free float* | 0.552 | 73 | 0.585 | 1,674 | -0.033 | (-0.95) | (-0.86) |

*Panel B: Correlations*

| *Variables* | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Downlisting announcement* | (1) | 1.000 | | | | | | | | | | |
| *Size* | (2) | **-0.128** | 1.000 | | | | | | | | | |
| *ROA* | (3) | **-0.098** | **0.164** | 1.000 | | | | | | | | |
| *Error announcement* | (4) | **0.063** | -0.015 | **-0.055** | 1.000 | | | | | | | |
| *Bid-ask spread* | (5) | **0.168** | **-0.770** | **-0.205** | 0.003 | 1.000 | | | | | | |
| *% zero return days* | (6) | **0.196** | **-0.393** | **-0.074** | 0.006 | **0.576** | 1.000 | | | | | |
| *Voluntary IFRS adoption* | (7) | **-0.115** | **0.096** | **0.070** | 0.035 | **-0.221** | **-0.383** | 1.000 | | | | |
| *Sales growth* | (8) | -0.035 | **-0.043** | 0.038 | 0.026 | 0.001 | 0.033 | 0.028 | 1.000 | | | |
| *Leverage* | (9) | 0.000 | **0.091** | **-0.251** | **0.076** | 0.007 | **0.077** | 0.039 | 0.003 | 1.000 | | |
| *Past return* | (10) | -0.012 | **0.073** | **0.175** | 0.008 | **-0.079** | 0.038 | 0.023 | 0.021 | -0.015 | 1.000 | |
| *Free Float* | (11) | -0.023 | **0.133** | **0.052** | 0.003 | **-0.264** | **-0.238** | **0.175** | 0.003 | 0.005 | -0.036 | 1.000 |

This table displays the descriptives for the variables used in the determinants model in Table 4.4. Definitions of variables are reported in Table 4.2 Panel A. In Panel B, bold letters indicate significance at the 10%-level.

Also consistent with our predictions, our variable that captures costs of enforcement action (*Error announcement*) turns out significantly positive (1% level) in models (1) and (2). This finding indicates that the direct and indirect costs associated with being investigated and, ultimately, censured by the two-tier enforcement panel are likely to be substantial, and for some firms may outweigh the benefits from being subjected to that enforcement regime. With regard to economic effects, mandated publication of an enforcement error finding during the past fiscal year increases a firm's probability of downlisting substantially, by 71.4% (68.2%) in model (1) (model (2)). In model (3), we substitute the error announcement variable by two non-overlapping indicator variables for high and low error severity. Only the coefficient on high severity loads significantly (at the 1 % level), indicating that the downlisting likelihood increases with the severity of the errors established by the enforcement institutions. The coefficient on *High error severity* translates into an increase of the firm's downlisting likelihood by 127.1% in case of a highly severe error. This finding prevails for an alternative measure of severity, where all firms with at least one income-related error are coded as high error severity firms (untabulated).

All our test variables that capture transparency benefits accruing from adopting and complying with high quality accounting standards show the predicted signs. The positive signs on both our measures of liquidity (*Bid-ask spread* and *% zero return days*, both significant at the 10 % level) suggest that firms with lower liquidity are more likely to move to the exchange-regulated market. A one standard deviation increase in *Bid-ask spread (% zero return days)* increases the probability of downlisting by 24.0% (12.0%). Second, the coefficient on the *Voluntary IFRS adoption* variable is negative and, in models (1) and (3), significant (at the 10 % level). Hence, firms which presumably benefited particularly from the transparency benefits associated with IFRS adoption are less likely to downlist. This decision to voluntarily adopt high-quality international standards prior to 2005 translates into a 30.9% (24.6%) reduction for the likelihood of downlisting in model (1) (model (2)).

In model (4), we re-estimate the baseline model (1) for a reduced sample, to include into the analyses our proxy for managerial opportunism, discretionary accruals. The coefficient on the discretionary accruals variable turns out positive, yet does not do so in a statistically significant manner. Also, the inclusion of *Discretionary accruals* barely

impacts the results from model (1), which we demonstrate by re-estimating for comparative reason model (1) for the sub-sample (model (5)).

**Table 4.4:**    Determinants of firms' decisions to downlist

| Panel A: Regression results | | | | | | |
|---|---|---|---|---|---|---|
| | | *Full sample* | | | *Subsample* | |
| ***Variables*** | Prediction | (1) | (2) | (3) | (4) | (5) |
| *Size* | - | -0.095 | -0.131 | -0.096 | -0.171 | -0.194 |
| | | (-1.73)* | (-2.94)*** | (-1.73)* | (-1.76)* | (-1.99)* |
| *ROA* | - | -1.008 | -1.108 | -1.021 | -1.192 | -1.285 |
| | | (-2.42)** | (-2.69)*** | (-2.42)** | (-1.64) | (-1.72)* |
| *Error announcement* | + | 0.714 | 0.682 | | 0.685 | 0.683 |
| | | (2.82)*** | (2.70)*** | | (2.16)** | (2.18)** |
| *High error severity* | + | | | 1.115 | | |
| | | | | (2.74)*** | | |
| *Low error severity* | | | | 0.500 | | |
| | | | | (1.48) | | |
| *Bid-ask spread* | + | 0.229 | | 0.225 | 0.144 | 0.127 |
| | | (1.90)* | | (1.86)* | (0.81) | (0.73) |
| *% zero return days* | + | | 0.687 | | | |
| | | | (1.67)* | | | |
| *Voluntary IFRS adoption* | - | -0.309 | -0.246 | -0.313 | -0.345 | -0.338 |
| | | (-1.81)* | (-1.38) | (-1.83)* | (-1.43) | (-1.38) |
| *Discretionary accruals* | | | | | 1.722 | |
| | | | | | (1.07) | |
| *Sales growth* | | -0.363 | -0.373 | -0.334 | -0.176 | -0.169 |
| | | (-1.52) | (-1.54) | (-1.44) | (-0.86) | (-0.85) |
| *Leverage* | | -0.295 | -0.286 | -0.332 | 0.502 | 0.546 |
| | | (-2.05)** | (-2.04)** | (-2.22)** | (1.03) | (1.14) |
| *Past return* | | -0.136 | -0.097 | -0.140 | -0.157 | -0.181 |
| | | (-0.80) | (-0.58) | (-0.83) | (-0.66) | (-0.74) |
| *Free float* | | -0.174 | -0.200 | -0.176 | -0.279 | -0.250 |
| | | (-0.73) | (-0.84) | (-0.74) | (-0.86) | (-0.77) |
| *Constant* | | -2.668 | -3.161 | -2.617 | 2.182 | 2.444 |
| | | (-4.60)*** | (-4.90)*** | (-4.30)*** | (2.52)*** | (2.75)*** |
| *N (obs.)* | | 1,747 | 1,747 | 1,747 | 1,014 | 1,014 |
| *N (downlisting obs.)* | | 73 | 73 | 73 | 49 | 49 |
| *Pseudo R-Squared* | | 0.21 | 0.21 | 0.22 | 0.26 | 0.26 |
| *Industry-fixed effects* | | yes | yes | yes | yes | yes |
| *Year-fixed effects* | | yes | yes | yes | yes | yes |
| *Control for FSE* | | yes | yes | yes | yes | yes |
| *Clustered standard errors* | | firm | firm | firm | firm | firm |

*Table 4.4 (continued)*

Panel B: Economic effects

| Variables | Standard Deviation | Model (1)[1] One SD change | Model (1)[1] Variable equals one | Model (2) One SD change | Model (2) Variable equals one |
|---|---|---|---|---|---|
| Size | 2.294 | -0.219 | | -0.300 | |
| ROA | 0.130 | -0.131 | | -0.144 | |
| Error announcement | 0.172 | | 0.714 | | 0.682 |
| High error severity | 0.083 | | 1.271[1] | | |
| Low error severity | 0.151 | | 0.472[1] | | |
| Bid-ask spread | 1.046 | 0.240 | | | |
| Zero return days | 0.174 | | | 0.120 | |
| Voluntary IFRS adoption | 0.474 | | -0.309 | | -0.246 |

Panel A of this table displays coefficient estimates using industry- and year-fixed effects and standard errors clustered by firm from a probit model. The dependent variable is *Downlisting announcement*, a binary variable indicating that a firm announced its intent to downlist. Definitions of variables are reported in Table 4.2 Panel A. z-values are reported in parentheses. ***, **, and * indicate significance at the 10%, 5%, and 1% levels, respectively. Panel B displays economic effects for variables from Models (1) and (2) based on one standard deviation change for continuous variables and the value one for binary variables.

[1]Economics effects on *High error severity* and *Low error severity* are based on Model (3).

## 4.4 Market reactions to downlisting announcements

### 4.4.1 Theoretical background

On a semi-strong form efficient market, market prices instantaneously and correctly reflect all new information made available to the investment public. Market value reactions to firms' announcements of their intent to downlist are therefore reflective of investors' assessments of the benefits and costs that firms are expected to experience by moving from the regulated market to the unregulated market. Hence, investigation of market reactions potentially provides a complementary perspective on managers' motives that underlie the decision to downlist, from the investors' point of view.

As noted in section 4.3.1, there are essentially two economic explanations for downlistings, which are associated with different predictions with respect to the sign of market value reactions. Under the *cost savings hypothesis*, the decision to downlist reflects that managers deem the cost of being quoted in the regulated market to outweigh the benefits. Or rather, they believe the cost-benefit trade-off is more positive for the firm if it went to the open market, dispensing with reporting and compliance costs. In this case, the announcement to downlist represents positive news, as it implies implementation of a listing policy which potentially yields cost savings and, hence, increases firm value.

Under the competing *agency hypothesis*, downlisting might represent a rational management strategy, because the decrease in transparency and the opt out from the scrutiny of the public enforcement mechanism potentially increase management's leeway to appropriate benefits of private control at the cost of shareholders. If market participants believe that the decision to downlist is driven by such an opportunistic motive, they would regard this as an indication of potential firm value reductions from expected appropriation of private control benefits by managers, and discount market value accordingly.

Finally, it needs to be borne in mind that the announcement of downlisting intent may also reveal new information concerning the firm's future prospects of success. For instance, managers' reasonable decision to downlist under the cost savings hypothesis might be driven by their private knowledge of lower expected firm growth in the future, which reduces financing needs and might therefore tip the cost-benefit trade-off in favor of leaving the regulated market. In this case, the market learns of firm value decreases (poor prospects) and value increases (cost savings from downlisting) at the same time. Hence, observable negative market reactions can be reconciled with both explanations, the agency and the cost savings motive.

### 4.4.2 Research design

We investigate market reactions to downlisting announcements to shed light on the three proposed explanations and to gain an understanding of market perceptions pertaining to the costs and benefits of leaving the regulated market. Hence, we estimate the following Equation (2), which investigates the market perception of constructs similar to our original determinants analysis:

(2)    *Stock price reaction$_{it}$ = Reporting and compliance costs$_{it}$ + Cost of enforcement$_{it}$ +*

   *Transparency benefits$_{it}$ + $\sum$ Controls$_{it}$ + $\sum$ Fixed effects$_{it}$ + ε*

The dependent variable, stock price reaction, is measured as the cumulative market adjusted return (*CMAR*) around the firm's downlisting announcement. We examine a three-day window around the announcement date [-1; 1] to account for the possibility that the intent to downlist was already factored into prices the day prior to the actual announcement (Doidge et al. 2010, Fernandes et al. 2010). Cumulative market adjusted returns are calculated relative to the CDAX (i.e., all German firms listed on the FSE) as

a proxy for the market portfolio. We test whether *CMARs* around the announcement date are significantly different from zero using standard errors clustered by announcement month.

Most variables we use to proxy our three vectors of determinants correspond to the variables used in our determinants analysis, yet with somewhat different interpretations, which follow from the three generic interpretations of market reactions outlined in section 4.4.1. As the determinants analysis yields that firms select to downlist based on those very variables, the variation therein is lower, and results mechanically weaker.

*Cost savings hypothesis.* We retain profitability (*ROA*) as a direct measure of potential cost savings, expecting a positive sign. In line with Leuz et al. (2008), we exclude *Size* and instead include *Market capitalization* as a control variable. Our second measure of potential cost savings is the voluntary IFRS adoption indicator variable, which indicates firms historically bonding themselves to higher standards of transparency and compliance. As such a bonding potentially lends credibility to downlisting announcements reflecting a cost-benefit trade-off, we predict an incrementally positive market reaction to downlisting announcements by these firms. In line with our perspective of liquidity as an indicator of transparency benefits, we expect a negative association with market value, i.e., that the market greets the downlisting decision for firms with low liquidity and low pertinent transparency benefits. We solely use *Bid-ask spread* as our measure of liquidity for this analysis, as this measure captures among other things information asymmetry. Finally, as noted, firms that have been censured by the enforcement mechanism before have potentially experienced high enforcement costs already. To the extent that they expect these costs to persist or recur, opting out of the enforcement mechanism may represent a rational strategy. We use *Error announcement* to measure enforcement exposure, and *High (Low) error severity* as an indicator for firms with relatively high (small) costs following from that exposure.

*Agency hypothesis.* If firms that have been censured for erroneous accounting announce their downlisting intent, markets may also regard this as a negative sign, because it indicates that managers which have been 'caught red-handed' attempt to escape the critical eyes of enforcers in the future, which is consistent with the endeavor to retain or increase private control benefits. Therefore, we have no prediction for the sign of the market reaction to downlisting announcements by censured firms. Due to sample size, we confine our analysis to the full sample, excluding *Discretionary accruals*.

*New information.* It is obviously difficult to establish whether a downlisting announcement reveals additional information, in particular negative future prospects. However, on a very general level, it is reasonable to assume that such information revelation is dependent on the overall quality of the firm's information environment, which is in turn captured, e.g., by liquidity. Therefore, we predict that as liquidity decreases, the likelihood for negative information content of the downlisting announcement increases. Hence, from an information revelation perspective, we expect a positive association between liquidity and the market value reaction, while we expect a negative association from a cost savings perspective. To introduce a more direct measure of new information, we use *Future ROA* instead of current *ROA*, and predict a positive sign.

Finally, we include *Market capitalization* and *Free float*, i.e., the percentage of free float shares on the day of the downlisting announcement, as control variables. Further, in line with Fernandes et al. (2010), we include industry-fixed effects and standard errors clustered by announcement month. Similar to the determinants model, we also control for firms being listed on the FSE. Definitions of variables used in Equation (2) are summarized in Table 4.2, Panel B.

### 4.4.3   Sample selection

For the event study, we add six observations to the previous sample of 73 downlisting observations because unlike for the determinants model, the data required for the event study is available for these observations, and remove one firm because the required data is not available. Repeatedly, firms announce their intent to downlist simultaneously on the same day as other news such as earnings or capital measures. Thus, we exclude nine observations from the analysis of the market reactions due to these confounding events. Additionally, we exclude five observations of firms with stocks traded on less than 25% of trading days in the year prior to the announcement date, since stocks of these firms are highly illiquid. This results in a final sample of 64 firms for the event study (Table 4.1, Panel D).

### 4.4.4   Empirical findings

Panel A of Table 4.5 reports average cumulative market adjusted returns (*CMARs*) for the three day window around the announcement date for the full sample. The results reveal that the average market reaction around the first-time announcement of the intent

to downlist is significantly negative (-0.019) at the 5% level. However, the number of firms that experience positive and negative announcement returns, respectively, is relatively even (29 and 35, respectively), which demonstrates that investor perceptions of downlisting decisions vary substantially on the firm-level.

**Table 4.5:**     Market reactions to downlisting announcements

*Panel A: Cumulative market adjusted returns around downlisting announcements*

| *Sample* | *CMARs* | *t-value* | *Wilkoxon z-value* | *N* | *%* | *N (pos)* | *% (pos)* |
|---|---|---|---|---|---|---|---|
| *All firms* | -0.019 | (-2.35)** | (-1.99)** | 64 | 100.0% | 29 | 45.3% |

*Panel B: Determinants of cumulative market adjusted returns around downlisting announcements*

| *Variables* | (1) | (2) | (3) |
|---|---|---|---|
| *Voluntary IFRS adoption* | 0.034 | 0.035 | 0.023 |
| | (1.53) | (1.71)* | (1.19) |
| *Bid-ask spread* | -0.008 | -0.009 | -0.003 |
| | (-0.58) | (-0.66) | (-0.25) |
| *Error announcement* | -0.054 | | -0.039 |
| | (-1.81)* | | (-1.51) |
| *High error severity* | | -0.099 | |
| | | (-1.93)* | |
| *Low error severity* | | -0.034 | |
| | | (-1.13) | |
| *ROA* | 0.071 | 0.064 | |
| | (1.52) | (1.32) | |
| *Future ROA* | | | 0.156 |
| | | | (3.10)*** |
| *Market capitalization* | -0.008 | -0.008 | -0.009 |
| | (-0.99) | (-0.95) | (-1.11) |
| *Free float* | -0.004 | -0.005 | 0.000 |
| | (-0.13) | (-0.16) | (0.01) |
| *Constant* | -0.027 | -0.030 | 0.008 |
| | (-0.69) | (-0.72) | (0.19) |
| *N* | 64 | 64 | 61 |
| *Adjusted R-squared* | 0.01 | 0.04 | 0.14 |
| *Industry effects* | yes | yes | yes |
| *Control for FSE* | yes | yes | yes |
| *Clustered standard errors* | month | month | month |

Panel A of this table reports three-day [-1;1] cumulative market adjusted returns (CMARs) in the respective event windows around firms' announcements to downlist. ***, ** and * indicate two-tailed significance at the 1%, 5%, and 10% levels, respectively, from testing whether cumulative market adjusted returns are different from zero using robust standard error clustered by announcement month. N(pos) (% (pos)) denotes the respective (percentage) number of firms with positive CMARs. Panel B of this table reports results from regressing the variables of interest on three-day [-1;1] market adjusted returns relative to the CDAX around the announcement date of downlisting using robust standard errors clustered by announcement month and industry fixed effects. Definitions of variables are reported in Table 4.2 Panel B. Descriptive statistics are reported in Appendix D. t-values are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel B of Table 4.5 presents the results from estimating three versions of Equation (2). In addition to the original model (1), we use the high / low enforcement cost partition in model (2), and future ROA instead of current ROA in model (3). With respect to the potential cost savings rationale, the coefficient for the variable indicating voluntary IFRS / US-GAAP adopters shows the predicted positive sign, but is only weakly significant for model (2) at the 10% level. This might point towards markets perceiving downlisting decisions by these firms to be more credible in the sense of being value-enhancing. Our second indicator of transparency benefits, liquidity, measured by *Bid-ask-spread*, does not support this reasoning, as liquidity appears to be positively, but insignificantly, associated with market reactions. However, as noted, we also need to interpret the negative sign on the bid-ask spread in terms of our information revelation prediction. Accordingly, the downlisting announcement reveals negative information to the market, which is more relevant to less liquid (less transparent) firms. The coefficient on our indicator variable for firms censured by the enforcement mechanism (*Error Announcement*) shows a negative sign and is weakly significant for model (1) (10% level). Findings from model (2) reveal that this impact is slightly more pronounced in case of highly severe errors (*High error severity*). This represents weak evidence that the market subscribes to the agency motive for such firms.

In model (3), we use future ROA instead of current ROA. This leaves most findings essentially unaltered, while yielding a highly significant positive coefficient on future ROA. This finding is in line with information revelation, as it indicates that the market infers negative future prospects from announcements, and prices them accordingly.

## 4.5 Post downlisting analyses

### 4.5.1 Objectives and research design

To shed further light on the determinants, but also on potential economic and accounting effects of downlisting decisions, we exploit the availability of both market and accounting data for firms after migrating from the regulated market to the open market. In order to analyze a representative period of two (fiscal) years after the downlisting, we restrict our analyses to a subsample of firms that effectively downlisted prior to fiscal year end 2013. We perform two analyses. First, we document accounting standard choice by inferring whether firms, after dispensing with the IFRS mandate, switched to German GAAP, or whether they decided to voluntarily resume IFRS reporting instead.

Second, we analyze how firm characteristics evolve after the downlisting decision. This analysis aims at gleaning further insights into effects that downlisting firms potentially anticipated, and potentially consequences of the downlisting. We note that our research design cannot distinguish between these two phenomena. To implement the analysis of firm characteristics, we compare our sample of downlisting firms to a sample of comparable firms, which decided not to downlist in the respective year. To proxy for these "counterfactual" firm-year observations, we identify firms that were similar to our downlisting firms when the downlisting decision was announced. We use propensity score matching and match firms based on Equation (1) using only the vector variables of interest, i.e., *Size*, *ROA*, *Error announcement*, *Bid-ask spread*, and *Voluntary IFRS adoption*. We then compare firm characteristics between both samples for the two fiscal years before and after the actual downlisting.

### 4.5.2 Sample selection

For the post downlisting analyses, we exclude 12 firms that migrated to the exchange-regulated market after fiscal year end 2013. Further, we exclude eight firms because the migration data is not available, in particular, because these firms have not yet migrated, and one firm because the financial report prior to the downlisting is not available. This results in a sample of 52 firms for the post downlisting analysis. To examine a balanced sample, we exclude firms for which the required data was not available for all fiscal years examined, e.g., due to a delisting. This leads to a final sample of 39 firms (Table 4.1, Panel E).

### 4.5.3 Empirical findings

Table 4.6 reports results of our post downlisting analyses. Panel A reveals that more than half our sample firms, 22 out of 39, voluntarily chose to resume IFRS reporting after opting out of the IFRS mandate, rather than switching to presumably less expensive domestic GAAP. While purely descriptive in nature, this finding suggests that for a large fraction of firms, dispensing with costly IFRS reporting was not the motive for the downlisting decision. Or rather, these firms downlisted although they appear to experience net benefits from IFRS reporting.[8] Hence, this observation is in line with the en-

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[8] We re-estimate Equation (1) at the migration date using the switch to German GAAP as the dependent variable to assess the determinants of a firm's switch to German GAAP. Findings reveal that firms are significantly more likely to switch to German GAAP when they are comparably small and

forcement costs being a particularly strong opt out driver for a large fraction of down-listing firms.

**Table 4.6:**  Post downlisting analysis

*Panel A: Accounting standard choice (balanced sample)*

|  | $t_{-1}$ | $t_0$ | $t_{+1}$ | $t_{+2}$ |
|---|---|---|---|---|
| IFRS | 39 | 39 | 23 | 22 |
| German GAAP | 0 | 0 | 16 | 17 |

*Panel B: Descriptive statistics for downlisting firms pre and post downlisting, relative to a sample of PSM matched firms*

|  | $t_{-1}$ | $t_0$ | $t_{+1}$ | $t_{+2}$ | Diff. $(t_{+2}-t_{-1})$ | (t-stat) | N |
|---|---|---|---|---|---|---|---|
| *Size* | | | | | | | |
| PSM matched | 11.091 | 11.048 | 11.134 | 11.232 | 0.141 | (0.46) | 36 |
| Downlisting | 11.145 | 11.044 | 10.881 | 10.859 | -0.286 | (-0.82) | 36 |
| Diff. | -0.054 | 0.004 | 0.253 | 0.372 | 0.427 | (0.92) | |
| (t-stat) | (-0.17) | (0.01) | (0.76) | (1.10) | | | |
| *ROA* | | | | | | | |
| PSM matched | -0.003 | -0.062 | -0.018 | 0.006 | 0.009 | ( 0.19) | 36 |
| Downlisting | -0.019 | -0.027 | 0.011 | -0.011 | 0.008 | (0.23) | 36 |
| Diff. | 0.016 | -0.035 | -0.030 | 0.018 | 0.001 | (0.02) | |
| (t-stat) | (0.39) | (-0.84) | (-0.70) | (0.41) | | | |
| *Bid-ask spread* | | | | | | | |
| PSM matched | -3.334 | -3.209 | -3.300 | -3.402 | -0.068 | ( -0.43) | 36 |
| Downlisting | -3.242 | -3.120 | -2.940 | -3.130 | 0.112 | (0.74) | 36 |
| Diff. | -0.093 | -0.089 | -0.359 | -0.272 | -0.179 | (-0.83) | |
| (t-stat) | (-0.62) | (-0.57) | (-2.33)** | (-1.75)* | | | |
| *% zero return days* | | | | | | | |
| PSM matched | 0.186 | 0.195 | 0.184 | 0.163 | -0.023 | (-0.46) | 36 |
| Downlisting | 0.258 | 0.284 | 0.311 | 0.313 | 0.055 | (0.96) | 36 |
| Diff. | -0.072 | -0.089 | -0.126 | -0.150 | -0.078 | (-1.02) | |
| (t-stat) | (-1.36) | (-1.78)* | (-2.39)** | (-2.74)*** | | | |
| *Audit fees* | | | | | | | |
| PSM matched | 4.793 | 4.789 | 4.821 | 4.881 | 0.088 | (0.38) | 31 |
| Downlisting | 4.716 | 4.658 | 4.418 | 4.363 | -0.353 | (-1.40) | 31 |
| Diff. | 0.077 | 0.131 | 0.404 | 0.518 | 0.441 | (1.28) | |
| (t-stat) | (0.34) | ( 0.61) | (1.58) | (2.00)** | | | |

Panel B of this table summarizes descriptive statistics of downlisting firms from the balanced sample (Panel A) relative to a sample of PSM matched firms (matched at the announcement date) based on the variables *Size*, *ROA*, *Error announcement*, *Bid-ask spread*, and *Voluntary IFRS adoption* from Equation 1. The sample reduction in three firms is attributable to the lack of suitable matches for these firms. $t_0$ equals the last fiscal year end prior to effectively downlisting. Definitions of variables are reported in Table 4.2 Panel A. ***, ** and * indicate two-tailed significance at the 1%, 5%, and 10% levels, respectively.

have not adopted IFRS voluntarily prior to 2005. Both coefficients are significantly negative at the 1% level.

Panel B of Table 4.6 reports results from our pre-post comparison of downlisting firms to a sample of PSM matched firms. The results indicate that after downlisting, firms on average decrease slightly in size, yet not significantly. However, untabulated analyses show that the decrease in size is significant for the group of firms that opted to switch to German GAAP. In contrast, no meaningful pattern can be observed with respect to firm profitability (*ROA*). For both measures of liquidity, the data shows significant differences between downlisting firms and comparable firms after downlisting. While the difference-in-differences is not significant, this evidence is broadly consistent with reduced transparency benefits in the less regulated markets. Finally, we also observe a reduction in audit fees. Untabulated results show that this effect is mainly driven by the firms that switched to German GAAP, resulting in an average reduction of audit fees of 12 percent (from 4.407 in $t_0$ to 3.866 in $t_{+2}$). This finding underscores that the switch to German GAAP likely creates cost savings.

## 4.6    Discussion

Our determinants analysis yields consistent evidence that for a substantial number of firms, the costs of preparing IFRS financial statements and being subject to strict enforcement outweigh the benefits from reporting high quality financial information to the market. The decline in audit fees post downlisting, in particular for firms that move to domestic GAAP, is consistent with this observation. These findings are in line with Fiechter et al. (2016), who document that for smaller firms in particular, IFRS compliance costs may be overly high. Therefore, we show that the Fiechter et al. (2016) findings are not specific to Switzerland, but rather generalize to other settings as well. Hence, this combined evidence is consistent with a rather general pattern: many of the firms which were initially affected by the IFRS mandate decide to opt out of this reporting standard due to specific firm-level cost-benefit trade-offs. This casts up the question of whether IFRS as they stand are overly costly to implement, owing to standard complexity and exhaustive disclosure requirements. An alternative view would be to greet this pattern, as firms that have little to gain from high quality reporting standards geared to investor demands are pushed out of the IFRS mandate. Put differently, we believe that these observations should be of interest to standard setters such as the IASB, and to regulators. On a different note, the ongoing stream of opt outs may challenge the IASB's claim as a setter of globally accepted standards for listed firms, if effectively IFRS are standards which benefit only very few specific, large listed firms. This ever more so as one rationale for the IFRS mandate, to create and exploit network externali-

ties by forcing listed firms to prepare comparable financial statements, is likely to lose relevance with the increasing number of listed firms that cease to apply IFRS.

Going beyond Fiechter et al. (2016) and Christensen et al. (2013), findings from all three sets of analyses demonstrate that costs of enforcement also drive firms' opt out decisions, and that on many occasions, enforcement indeed appears to be the primary downlisting driver. By the same line of reasoning, this result casts up the question of whether enforcement is too costly indeed, and why. More importantly though, our specific setting allows us to identify that as firms face increasing costs from enforcement action, they become more likely to opt out and dodge FREP / BaFin oversight. Hence, while the concurrent IFRS literature is still debating whether enforcement facilitates positive IFRS benefits or creates benefits per se (Christensen et al. 2013, Barth and Israeli 2013), our setting provides identification of a link between costs of enforcement and firms' downlisting decisions, which entail economic consequences. To that end, our identification of an enforcement cost effect is stronger, e.g., than evidence on IFRS and enforcement-related benefits documented by Christensen et al. (2013). At the same time, we are not able to fully disentangle the precise nature of enforcement cost, i.e., whether these costs are borne by shareholders, or rather by (opportunistic) managers, who to the potential harm of shareholders evade enforcement scrutiny to appropriate private control benefits. If anything, the findings from our event study indicate that the market in many cases suspects the latter, as evidenced by incrementally more negative reactions for firms censured by the enforcement mechanism, and for firms that step back from a prior commitment to transparency ("de-bonding"). However, as a limitation, most of the observed market reactions in our setting are also consistent with the revelation of new, negative information about future prospects. This leads us to caution that we cannot ultimately identify which managerial motives market participants assume, and which they do not.

The combined findings on IFRS and enforcement related motives for downlisting decisions not only shed light on the pertinent costs and their economic significance. They also underscore that any academic study which investigates economic outcomes of IFRS adoption based on samples which include reporting years after initial IFRS adoption in 2005 is potentially prone to sample selectivity. Our findings demonstrate that the IFRS mandate is one that firms effectively select to adopt by not opting out, rather than being forced to do so. Hence, quite likely, it is those firms that yield particularly sub-

stantial benefits from IFRS compliance and enforcement, e.g., in the shape of liquidity benefits, that consistently opt to stick to the IFRS mandate. Therefore, although to a lesser degree, studies on mandatory adoption effects may be subject to similar sample selection issues as earlier studies on voluntary adoption (Soderstrom and Sun 2007).

## 4.7 Conclusion

This paper exploits an exogenous shock to the cost-benefit trade-off of firms being listed in EU-regulated markets, which enables us to identify (prohibitive) costs of IFRS compliance and enforcement. We find that the costs of IFRS adoption and the associated transparency benefits are important drivers of individual firms' decisions to opt out of the IFRS mandate. Most importantly though, we provide strong evidence that for a substantial number of firms that opted out of the regulated market, dispensing with enforcement supervision appears to be the principal motive. Our findings on the role of enforcement related costs are particularly strong due to the quality of our empirical proxies (being censured for erroneous accounting, severity of error findings), and because we are able to exploit the observability of accounting standards choice after firms downlisted. Hence, we contribute to the scarce literature on costs associated with the EU's IAS regulation, unveiling another set of potentially "unintended consequences" (Brüggemann et al. 2013, Ball 2016). In particular, we contribute to the literature on the role and effects of EU enforcement of IFRS. Other than most pertinent papers in this literature, we are able to provide identification of an enforcement effect. Hence, our findings reiterate that "enforcement matters" (Christensen et al. 2013, p. 171) indeed, and that it likely presents the key driver for many downlisting decisions in our setting.

Our findings are important as they contribute to a literature that so far has been dominated by evidence of benefits associated with IFRS adoption and enforcement. For researchers active in this literature, our results suggest that studies that investigate effects of mandatory IFRS adoption need to carefully address selection issues stemming from the ever increasing number of firms that opt out of the IFRS mandate. Also, our findings should be of interest to regulators, e.g., with the European Union and its member states, and to the IASB, as they document that despite the global success of IFRS, the importance of this reporting standard faces challenges with respect to the actual number of listed firms that choose to adopt IFRS.

Finally, our findings point at several avenues for future research. For instance, issues of self-selection deserve increased attention for settings of mandatory IFRS adoption. Also, second-order effects of the decreasing number of IFRS adopters in countries such as Germany or Switzerland require investigation, e.g., regarding network or comparability benefits. Finally, we caution that, while we are able to identify an enforcement effect on downlisting decisions, we are unable to precisely discern to what extent the perceived costs of enforcement reduce firm value, or rather reduce managerial leeway to appropriate private control benefits.

## 4.8   Appendix

*Appendix A: Reporting and compliance requirements at Frankfurt Stock Exchange*

| Requirements | EU-regulated market | | Exchange-regulated market |
|---|---|---|---|
| | *Prime Standard* | *General Standard* | *Entry Standard* |
| *Mandatory IFRS-reporting* | Mandatory IFRS-reporting for consolidated financial statements (sec. 315a HGB) | | Voluntary IFRS-reporting for consolidated financial statements |
| *Annual financial report* | Preparation of annual financial reports („Jahresfinanzbericht') within four months of fiscal year end (sec. 37v, 37y WpHG) | | Publication of audited financial statements („Jahresabschluss') and management report within six months of fiscal year end (sec. 19 para. 1a GTC Open Market, sec. 264, 290 HGB) |
| *Semi-annual reports* | Preparation of semi-annual financial report within two months (sec. 37w, 37y WpHG) | | Preparation of semi-annual financial statement within three months (sec. 19 para. 1b GTC Open Market) |
| *Interim financial reports[1]* | Preparation of interim financial reports within two months (§ 51 BörsO, sec. 37w, 37y WpHG) | Publication of interim announcements around the end of the first and third quarter (sec. 37x WpHG) | - |
| *Additional reporting requirements[2]* | Ad hoc announcements (sec. 15 WpHG), directors' dealings (sec. 15a WpHG), voting rights notification (sec. 21 WpHG), capital measures notifications (sec. 30e WpHG) | | Publication of important information regarding securities and the issuers (sec. 19 para. 1c GTC Open Market) |
| *Language of publication* | German and English (sec. 50, 51 and 54 BörsO) | German or English | German or English (sec. 19 para. 6 GTC Open Market) |
| *Analyst meetings* | At least one meeting per year (sec. 53 BörsO) | - | - |
| *Enforcement of accounting standards* | Enforcement of accouting standards by FREP and BaFin (sec. 342b HGB, sec. 37n-37u WpHG) | | - |

This table displays reporting and compliance requirements as of 2014 for firms listed in the Prime Standard, General Standard, and Entry Standard of the Frankfurt Stock Exchange, respectively.

[1]Since November 2015, the preparation of interim financial reports for firms listed in the EU-regulated market is no longer required. Under the revised regulation, firms listed in the Prime Standard segment are required to prepare interim announcements within two months according to § 51 BörsO (revised version).

[2]From July 2016 on, firms listed in the exchange-regulated market are mandated to publish ad hoc announcements and directors' dealings.

*Appendix B: Court decisions pertaining to changes in downlisting requirements*

| Date | Court | Decision | Reference |
|------|-------|----------|-----------|
| 25 November 2002 | German Federal Court of Justice ('Bundesgerichtshof') | "Macrotron principles": the listing on the EU-regulated market could only be revoked if two conditions were met, (1) a majority vote of the shareholders' meeting in support of the delisting / downlisting decision, and (2) a mandatory cash offer to minority shareholders to buy back their stock, at a "reasonable" price which must equal at least the current market price | Decision of November 25, 2002 – II ZR 113/0 *("Macrotron" decision)* |
| 30 August 2007 | Munich Regional Court ('Landesgericht') | Ruling that the 2002 "Macrotron principles" were not applicable to the migration from an EU-regulated segment to the exchange-regulated m:access segment, because such a venture was not comparable to a delisting as addressed in the "Macrotron" decision | Decision of August 30, 2007 – 5 HK O 7195/06 |
| 21 March 2008 | Munich Higher Regional Court ('Oberlandesgericht') | Munich Higher Regional Court agreed that m:access was a higher quality segment than the regular open market (appeal proceedings against decision of Munich Regional Court) | Decision of May 21, 2008 – 31 Wx 62/07 |
| 17 June 2008 | Berlin Regional Court (‚Landgericht') | Berlin Regional Court followed the reasoning of the Munich Higher Regional Court and ruled that an offer to buy out minority shareholders (i.e., "Macrotron" principles) was not required when moving to the Entry Standard. | Decision of June 17, 2008 – 102 O 91/08 |
| 30 April 2009 | Berlin Superior Court of Justice ('Kammergericht') | Berlin Superior Court of Justice agreed with Berlin Regional Court (appeal proceedings against decision of Berlin Regional Court) | Decision of April 30, 2009 – 2 W 119/08 |
| 11 July 2012 | German Federal Constitutional Court (‚Bundesverfassungsgericht') | German Constitutional Court ultimately confirmed legal interpretation established in 2007 to 2009 court decisions | Decision of July 11, 2012 – 1 BvR 3142/07 |
| 08 October 2013 | German Federal Court of Justice ('Bundesgerichtshof') | "Macrotron principles" were completely revoked | Decision of October 8, 2013 – II ZB 26/12 *("FRoSTA" decision)* |

This table summarises court decisions pertaining to changes in downlisting requirements.

*Appendix C: Reasons for downlisting stated in ad hoc announcements*

| Panel A: Ad hoc announcements | N | % |
|---|---|---|
| Reason stated | 92 | 78.0% |
| No reason stated | 26 | 22.0% |
| **Total** | 118 | 100.0% |

| Panel B: Reasons stated in ad hoc announcements | N | % |
|---|---|---|
| Costs of the listing in the EU-regulated market / cost reduction | 48 | 52.2% |
| Reduction of administrative efforts | 42 | 45.7% |
| Cost-benefit ratio of the stock market listing | 30 | 32.6% |
| Costs of financial reporting | 12 | 13.0% |
| Switch to German GAAP | 6 | 6.5% |
| Increasing regulation in the EU-regulated market | 5 | 5.4% |
| Low trading volume | 4 | 4.3% |
| Costs of disclosures | 3 | 3.3% |
| Low free float | 1 | 1.1% |
| Increased liquidity if stocks are only traded at one stock exchange | 1 | 1.1% |
| Long-term increase of firm value | 1 | 1.1% |
| Migration is part of various measures for increased costs efficiency | 1 | 1.1% |
| Regional reorientation of the firm | 1 | 1.1% |
| Reduction of business segments | 1 | 1.1% |

This table summarizes reasons stated in firms' ad hoc announcements for downlisting. 26 out of 118 firms do not name reasons for their decision. % values in Panel B are based on the 92 firms that name a reason for downlisting.

*Appendix D: Descriptive statistics for the event study*

*Panel A: Descriptives*

| **Variables** | mean | sd | min | 25%-quartile | median | 75%-quartile | max | N |
|---|---|---|---|---|---|---|---|---|
| *CMARs* | -0.019 | 0.063 | -0.276 | -0.043 | -0.011 | 0.018 | 0.111 | 64 |
| *Voluntary IFRS Adoption* | 0.406 | 0.495 | 0.000 | 0.000 | 0.000 | 1.000 | 1.000 | 64 |
| *Bid-ask spread* | -3.095 | 0.661 | -4.637 | -3.357 | -3.121 | -2.761 | -0.913 | 64 |
| *Error announcement* | 0.203 | 0.406 | 0.000 | 0.000 | 0.000 | 0.000 | 1.000 | 64 |
| *High error severity* | 0.063 | 0.244 | 0.000 | 0.000 | 0.000 | 0.000 | 1.000 | 64 |
| *Low error severity* | 0.141 | 0.350 | 0.000 | 0.000 | 0.000 | 0.000 | 1.000 | 64 |
| *ROA* | -0.039 | 0.161 | -0.928 | -0.066 | 0.012 | 0.039 | 0.226 | 64 |
| *Future ROA* | -0.047 | 0.173 | -0.932 | -0.089 | 0.007 | 0.045 | 0.179 | 61 |
| *Market capitalization* | 3.557 | 1.564 | 0.270 | 2.552 | 3.445 | 4.688 | 7.695 | 64 |
| *Free float* | 0.518 | 0.323 | 0.030 | 0.230 | 0.500 | 0.785 | 1.000 | 64 |

*Panel B: Correlations*

| | | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|---|
| *CMARs* | (1) | 1.0000 | | | | | | |
| *Voluntary IFRS Adoption* | (2) | 0.1495 | 1.0000 | | | | | |
| *Bid-ask spread* | (3) | -0.0145 | 0.0661 | 1.0000 | | | | |
| *Error announcement* | (4) | **-0.2771** | 0.1145 | -0.0477 | 1.0000 | | | |
| *ROA* | (5) | 0.1158 | **-0.2133** | **-0.3433** | 0.0510 | 1.0000 | | |
| *Market capitalization* | (6) | -0.0259 | -0.1742 | **-0.6224** | -0.1789 | 0.1649 | 1.0000 | |
| *Free float* | (7) | 0.0372 | 0.0274 | 0.0326 | 0.1251 | 0.0510 | **-0.2317** | 1.0000 |

This table reports descriptive statistics for the variables used in the event study in Table 4.6. Definitions of variables are reported in Table 4.2 Panel B. In Panel B, bold letters indicate significance at the 10%-level.

## 5    Conclusion

### 5.1    Summary of major findings and implications of the thesis

In the light of the call for evidence-based disclosure regulation (Buijink, 2006; Gassen and Günther, 2014; Leuz and Wysocki, 2016), this thesis aims to investigate intended and unintended consequences of recent regulatory action in the fields of corporate governance and disclosure. Overall, main findings from this thesis emphasize that in the German continental European setting (1) regulation of disclosure and corporate governance does not increase, or may even decrease, shareholder welfare and that (2) regulation potentially drives firms away from high levels of disclosure. Consequently, evidence indicates that regulation fails to meet objectives intended by regulators. In the *first study*, that addresses regulation in the field of corporate governance, regulation of executive compensation contracts was intended to align incentives from remuneration arrangements with long term growth of the firm (Deutscher Bundestag, 2009b). However, unlike intended by regulators, regulation of executive compensation contracts decreased shareholder welfare. This finding indicates that private compensation contracts absent regulation were sufficient from a shareholder perspective. Also unlike argued by regulators (Deutscher Bundestag, 2015), evidence on investor perceptions of reduced requirements for leaving the EU-regulated market with its high disclosure requirements and high level of enforcement indicates that, in some cases, investors welcome reduced securities markets regulation (*second study*). By contrast, increased regulation of opt out requirements, that was intended to increase investor protection, does not seem to matter from an investor perspective. Therefore, the regulatory measure likely misses the objective of increased investor protection as it does not increase shareholder wealth. Moreover, evidence from this thesis also reveals that regulation of disclosure and enforcement can also lead to unintended consequences (*third study*). Findings from the final study indicate that costs of IFRS compliance and enforcement seem to have driven firms away from the EU-regulated market, and thus the IFRS mandate and the enforcement mechanism. From an investor perspective, these unintended consequences might be negative because the downlisting decreases the firm's level of disclosure and enforcement. However, on the upside, a systematic opt out of less liquid and less transparent firms increases the overall level of liquidity and transparency in the EU-regulated market.

Findings from the *first study* are in line with Larcker et al. (2011), who investigate regulation of executive compensation in the U.S., and document negative market reactions

for firms with excess CEO compensation. In the German two-tier system, an independent supervisory board sets management compensation, with the objective of enacting not only shareholders' interests, but also to recognize other stakeholders such as creditors or employees (e.g. Haar, 2012). Therefore, ordinary shareholders have less influence on board matters in Germany as, for example, in the U.S. (Larcker and Tayan, 2011). Despite these differences in the German governance model, and unlike intended by regulators (Deutscher Bundestag, 2009b), findings from the first study do not indicate beneficial effects of regulating executive compensation from an equity market perspective. This suggests that, at least from a shareholder perspective, there is no evidence in support of executive compensation regulation, be it in a shareholder-based economy or a stakeholder-oriented system.

Unlike prior U.S. findings that indicate that investors value the bonding to high disclosure requirements (Fernandes et al., 2010; Doidge et al., 2010), findings from the *second study* are mainly indicative of cost considerations, as proposed under the loss of competitiveness theory. The costs of the high level of disclosure in the EU-regulated market seem to occasionally outweigh the value of the bonding to the stricter disclosure requirements. Consequently, U.S. findings on changes in opt out requirements do not necessarily translate to the continental European environment, where a substantial number of firms has recently opted out of increased disclosure requirements (Fiechter et al., 2016; Pasch et al., 2015). While reductions in opt out requirements seem to have an impact on investors, as reflected in abnormally high trading volume, increases in the requirements for opting out do not. This finding should be of interest to regulators, as, unlike argued by regulators (Deutscher Bundestag, 2015), weak trading volume reactions around events related to increases in opt out requirements indicate that the regulation did not matter much to investors.

For some firms that have originally been subject to the IFRS mandate, pertinent costs of compliance and enforcement have been substantial, and appear to outweigh IFRS-related transparency benefits (*third study*). These findings are important because they cast light on a phenomenon that has so far received little attention in the literature, namely the systematic opt out of firms from the IFRS compliance and enforcement regime. This phenomenon may represent unintended consequences of IFRS adoption from a regulatory perspective (Brüggemann et al., 2013). This evidence of presumably restrictive compliance costs is of potential relevance for the IASB's approach to standard

setting, but also for the regulatory assessment of IFRS-related net benefits, for example, the EU Commission's current efforts to evaluate the IAS regulation and related network benefits.

## 5.2 Limitations

This thesis is subject to limitations as outlined in the respective chapters. First, while most provisions of the VorstAG regulation (*first study*) pertain to listed and private firms, findings relate to the former only. As governance mechanisms and ownership structures are distinctively different for private firms, findings on the impact of the regulation are not generalizable to these firms. Second, when applying an event study design, the measure of economic impact, firm value, reflects shareholders' welfare only. Therefore, the *first* and the *second study* are unable to give a thorough assessment of the usefulness of the regulation with respect to other stakeholders' welfare, such as creditors or employees. Event study methodology also critically relies on the precise identification of the events of interest. Since it was not possible to identify the exact publication date for the court rulings prior to 2012 (*second study*), which are likely to have had an impact on the costs of being able to downlist, the market assessment of these events is not recognized. Third, findings are subject to the quality of the empirical constructs. In the *first study*, as existing contracts in place cannot be directly observed, the study needs to rely on observable data on management compensation to identify firms with contracts that may provide for abnormally high remuneration, or that may only weakly tie pay to performance. In the *second study*, I am not able to directly measure costs of the listing and whether investors benefit from bonding to the EU-regulated market. I thus merely provide descriptive evidence on market reactions of firms presumably more affected by the regulation. Similarly, in the *third study*, the costs of IFRS compliance and transparency benefits cannot be directly observed. The study is also unable to disentangle the precise nature of enforcement costs. It remains largely an open question whether observed enforcement-induced downlistings in their majority capitalize cost savings for firm owners or rather do so for managers, who to the potential harm of shareholders evade enforcement scrutiny to appropriate private control benefits. Fourth, in the *second study*, I do not investigate the impact of the changes in the requirements on firms listed in the exchange-regulated market. These firms are affected by the regulation since changes in opt out requirements affect the value of the bonding to the EU-regulated market, which is an option for these firms. Finally, in the *third study*, the exogenous shock pertains to a shock in the requirements for downlisting and lowers costs

associated with downlisting, which can trip an unfavorable cost-benefit tradeoff. However, it does not affect the costs and benefits of the listing in the EU-regulated market.

## 5.3 Outlook

The takeaway that recent regulation of disclosure and corporate governance does not increase, or may even decrease, shareholder welfare, and potentially drives firms away from high levels of disclosure, even more highlights the need for evidence-based disclosure regulation as demanded by Buijink (2006), Gassen and Günther (2014), and Leuz and Wysocki (2016). Results from this thesis should be of interest to national and supranational regulators, in particular the European Union, as they emphasize that regulators should carefully evaluate whether regulation is required from an economic perspective. Findings raise the question of whether the level of regulation should even be reduced, in some cases. In line with such considerations, the European Union has recently abolished the quarterly reporting mandate stating: "The obligations to publish interim management statements or quarterly financial reports represent an important burden […], without being necessary for investor protection" (Directive 2013/50/EU (2013), p. L294/13). However, it remains an open question whether these rare attempts to reduce the level of regulation should also apply to other fields of disclosure and corporate governance regulation.

It is up to future research to demonstrate whether there are areas of disclosure and corporate governance where regulatory interference potentially generates welfare. As emphasized by Leuz and Wysocki (2016), most research in the field of disclosure regulation investigates the U.S. setting, in particular due to the high level of data availability. While prior findings from the U.S. on investor perceptions of regulating executive compensation translate to the German continental European setting, findings on investor perceptions of leaving a highly regulated disclosure regime differ from prior U.S. evidence. Consequently, the optimal level of regulation potentially varies across jurisdictions, and U.S. findings do not necessarily translate to different institutional settings. Therefore, future research should also investigate regulation of disclosure and corporate governance outside of the U.S.

Finally, findings on the downlisting phenomenon also indicate potential self-selection problems in studies that investigate implications or economic effects of mandatory IFRS reporting because systematic opt outs from this mandate may bias samples towards the

firms that likely benefit from increased transparency and enforcement. Any academic study which investigates economic outcomes of IFRS adoption based on samples which include reporting years after initial IFRS adoption in 2005 is potentially prone to sample selectivity. Thus, this phenomenon emphasizes the need to test whether prior results on economic effects of the IFRS mandate hold, when researchers control for the potential selection bias (e.g., Hitz et al, 2016).

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