

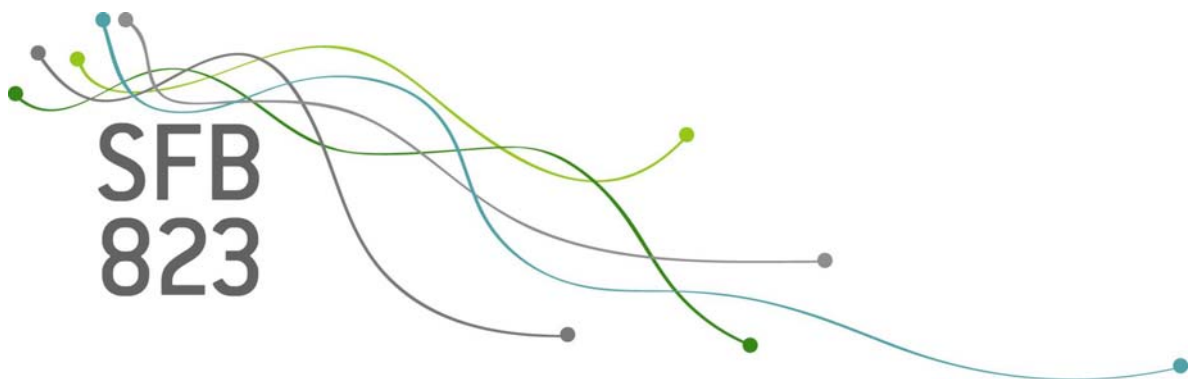
SFB  
823

# The impact of disclosure obligations on executive compensation - A policy evaluation using quantile treatment estimators

Katharina Dyballa, Kornelius Kraft

Nr. 57/2016

Discussion Paper





**The Impact of Disclosure Obligations on Executive Compensation**  
– **A Policy Evaluation Using Quantile Treatment Estimators**

**Katharina Dyballa<sup>\*\*</sup> and Kornelius Kraft<sup>\*\*\*</sup>**

**October 2016**

**Abstract**

This empirical study analyses the effects of the introduction of strongly increased disclosure requirements in Germany on the level of executive compensation. One innovative aspect is the comparison of companies which voluntarily followed a recommendation of the German Governance Code before the relevant law was implemented and published detailed information on executive compensation with other firms which did not. Conditional and unconditional quantile difference-in-differences models are estimated. The companies which refused to publish data before it became mandatory show a reduction in compensation levels for the upper quantiles. Hence, the mandatory requirement to publish detailed information reduced the higher levels of executive compensations, but did not affect executive compensation at lower or medium levels.

**JEL-Codes:** M52, M48, G38, L20, C31

**Key words:** Executive Compensation, Disclosure Obligations, Corporate Governance Regulation, Policy Evaluation, Quantile Treatment Effect

**Acknowledgements:** We are very grateful to the Kienbaum Consulting AG for the kind provision of extensive data on management compensation. We also thank the Deutsche Forschungsgemeinschaft for financial support via SFB 823 "Statistical modelling of nonlinear dynamic processes".

---

<sup>\*\*</sup> TU Dortmund, Faculty of Business, Economics and Social Sciences, Vogelpothsweg 87, D-44227 Dortmund, katharina.dyballa@tu-dortmund.de (corresponding author).

<sup>\*\*\*</sup> TU Dortmund, Faculty of Business, Economics and Social Science, Vogelpothsweg 87, D-44227 Dortmund, ZEW Mannheim and IZA Bonn, kornelius.kraft@tu-dortmund.de

## 1 Introduction

Most of the literature on executive compensation does not consider institutional factors like legislative interventions. Murphy (2013) criticizes this neglect and mentions disclosure requirements as one example of legislative action<sup>1</sup>. Disclosure requirements might well affect the total level of compensation as well as variable and fixed components. At least one might argue that this is what politicians have in mind when they introduce such requirements and it might be interesting to test whether its purpose is achieved. Although one of the aims is probably to limit management compensation, the effect is a priori unclear.

On the one hand, disclosure might have a leveling effect on executive compensation. Higher transparency is supposed to lower the shareholders' cost of monitoring the setting of executive compensation. This, in turn, might increase the directors' need to justify their choice of compensation structures, which might put pressure on inappropriately high executive compensation levels.

Furthermore, detailed information about an executive's compensation might cause an outrage constraint (negative reactions from interested parties such as institutional investors or professional colleagues, whose views are not unimportant to executives). Consequently, if managers care about their reputation they might be reluctant to ask for inappropriately high compensation levels (e.g. Zeckhauser and Pound (1990), Iacobucci (1998), Gordon (2005)).

Whereas in Germany information about compensation was previously published as an aggregated sum to include all board members, current disclosure requirements demand that remuneration details are provided for each individual by name. This offers the popular media an opportunity to disseminate such data and they will focus in particular on high compensation levels, irrespective of the performance of an executive. High income is frequently regarded in public debate as dubious and unjustified. This may well exert some pressure on the payment of high executive compensation, but probably not on low or medium level remunerations.

Therefore, assuming that board members care about the views of professional groups, their public reputation and the respect of the shareholders, they might be reluctant to ask for inappropriately high compensation levels (e.g. Zeckhauser and Pound (1990), Iacobucci (1998), Gordon (2005)).

On the other hand, stricter disclosure obligations may lead to higher executive pay levels. An increase in transparency could lead to a shift from fixed to variable compensation in order to

---

<sup>1</sup> Murphy (2013) chronologically describes reasons and reactions for several changes in US disclosure obligations over the last decades.

“hide” the high level of overall compensation in incentive-orientated pay<sup>2</sup>. Furthermore, higher transparency might imply a “ratcheting-up” effect, i.e. an increase in total compensation due to the availability of detailed information about the compensation levels at rival companies. Additionally, managers might regard the disclosure requirement as a way to signal to the management labor market high productivity by high compensation (e.g. Iacobucci (1998), Alarie (2003), Gordon (2005)).

Obviously, from a theoretical point of view, there are divergent hypotheses suggesting either an increase or a decrease in executive compensation as a result of stricter publication obligations. However, there are only a few studies which empirically investigate the impact of changes in disclosure rules on executive compensation. Most of the studies focus rather on pay-sensitivity than on absolute level of compensation.

Using New Zealand data, Andjelkovic et al. (2002) analyze executive compensation during the first year of mandatory pay disclosure rules and find no evidence of an increase in pay-performance sensitivity. Craighead et al. (2004) use Canadian policy changes in compensation disclosure in order to evaluate the impact on performance-based compensation. They find that mandatory disclosure obligations have a larger impact on the executive compensation in widely held firms than in closely held firms. This implies that pay-performance sensitivity increases more in less monitored (widely held) firms than in better monitored (closely held) firms. Clarkson et al. (2011) use Australian data and similarly they empirically detect an increase in pay-performance relation due to regulatory changes in disclosure requirements.

We use changes in German mandatory publication as a natural experiment in order to discover the causal effect on the level of executive compensation. Until 2005 Germany’s mandatory disclosure requirements concerning executive compensation were rather lax and vague, especially by international standards<sup>3</sup>. Back then stock listed companies were merely obliged to publish the total amount of compensation aggregated for the whole executive board. Starting in 2002, in an attempt to increase transparency around compensation, the German Corporate Governance Code (GCGC) introduced recommendations on publishing individual compensation levels and the components in the annual reports. Due to the fact that only a fraction of all companies followed the recommendations voluntarily by publishing

---

<sup>2</sup> The variable part might be designed in a way that the specified aims for management are normally reached and therefore the bonus is usually payed out.

<sup>3</sup> Fernandes et al. (2013) give an overview of the introduction of compensation disclosure laws across different countries. Accordingly, the US implemented mandatory disclosure obligation in 1934 (extended in the following years). In the following years many other countries followed by introducing similar mandatory disclosure rules including: Canada in 1993, UK in 1995, Ireland and South Africa in 2000; Australia in 2004, Belgium, France, Germany, Italy, the Netherlands and Sweden, Norway and partly Switzerland in 2006.

detailed information on executive compensation, a new law, the Act on the Disclosure of Management Board Compensation<sup>4</sup> (VorstOG<sup>5</sup>), was implemented in 2006.

The VorstOG introduced mandatory disclosure obligations to improve information on compensation. Since then stock companies have been legally compelled to publish executive compensation differentiated according to its components and on an individualized level. Furthermore, the law introduces the mandatory disclosure of stock options. The main argument of German legislation put forward to justify the implementation of stricter mandatory disclosure obligations was to protect shareholders' interests. The legislation was based on the assumption that better information on remuneration encourages shareholders to represent their interest towards managers more efficiently.

German legislation (with its initially voluntary disclosure recommendations and later mandatory rules) provides an interesting setting to use a difference-in-differences approach in order to evaluate the causal impact of changes in mandatory disclosure on executive compensation. Firms which followed the voluntary recommendations are compared with those which did not in order to test for possible differences between these firm types. Furthermore, due to the fact that we assume that the impact of policy change may differ across the compensation distribution we extend the standard difference-in-differences approach to conditional and unconditional quantile regression.

For our empirical analysis we use panel data from 84 stock listed German companies covering the years from 2002 to 2011. Our dataset includes information on total compensation per head (provided by Kienbaum), company financials (dafne) and corporate governance information (self-collected).

Our main findings reveal a decrease in total compensation as a result of the implementation of the VorstOG, which is in line with our main hypothesis claiming that higher transparency might intensify shareholders' opportunities to monitor the supervisory board's compensation setting and/or an outrage constraint on managers. Interestingly, the leveling effects are merely significant in the upper part of the compensation distribution.

Both the extent of compensation reduction and its statistical significance support our hypothesis, suggesting that companies in the upper part of the compensation distribution are in general more likely to be subject to public scrutiny and thus also experience higher pressure.

The remainder of this paper is organized as follows. Section 2 describes the German board system and provides an overview of German changes regarding mandatory disclosure

---

<sup>4</sup> § 285 (9) HGB (German Commercial Code)

<sup>5</sup> Vorstandsvergütungsoffenlegungsgesetz

obligations. Section 3 summarizes current literature and develops our main hypothesis. Information on the data and identification strategy is provided in section 4, followed by the presentation of our empirical results in section 5. We finish this paper with a conclusion in section 6.

## **2 The German board model and disclosure obligations**

Executive compensation is a highly discussed topic – both politically and in the media. The standard conflict between managers and shareholders, based among other things on the assumptions of managers, who maximize short-term interests, and shareholders, who follow long-term interests. This problem is usually analyzed by applying a principal-agent model. In such a context the shareholder (principal) engages a manager (agent) to act in his or her interest (Jensen and Meckling 1976). However, due to the well-known problem of asymmetric information, managers could use their discretionary power for opportunistic behavior to maximize their own utility to the disadvantage of the shareholders. One of the general aims in corporate governance is to minimize managerial opportunistic behavior by implementing several governance tools. The German two tier board system<sup>6</sup>, for example, implements a control institution – the supervisory board – with the explicit task of controlling executives to ensure that shareholders' interests are upheld. Amongst other issues, the supervisory board is responsible for setting the management compensation. Thus, management compensation could serve as an instrument to align shareholders' and managers' interests by setting adequate monetary incentives.

However, the composition of the supervisory board does not always reflect the interests of the shareholders. Only a minority of supervisory boards include one or more shareholders as members. The members are mostly executives from other companies or from banks. Friendly relationships between executives and supervisory board members or interlocked board memberships raise the question as to what extent shareholders' interests are adequately represented by supervisory board members. Therefore it is unclear whether the supervisory boards always control executives efficiently and set compensation in an optimal way. To the detriment of the shareholders, managers and supervisory board members might even share similar interests (that differ from those of the shareholders), resulting in inappropriately high compensation levels (Bitter, 2005).

---

<sup>6</sup> In contrast to the American one tier system a dual board system differentiates between the management board and the supervisory board. The former has the task of managing the company, whereas the latter is supposed to supervise and advise the management board.

In order to improve the corporate governance structure and thus the representation of shareholders' interests, German legislation implemented the German Corporate Governance Code (GCGC) in 2002<sup>7</sup>. This code is based on the concept of "soft laws" including proposals and recommendations aiming for a more transparent and comprehensible German corporate governance system. According to §161 of the German Stock Corporation Act, listed stock companies must annually confirm that they comply with the recommendations of the GCGC by publishing a declaration of compliance attached to their annual report. In case of deviation companies are additionally obliged to mention the reason for this.

With regard to executive compensation German legislation previously required only that companies report the overall compensation for the management board as a whole. In order to increase transparency the GCGC recommended the detailed disclosure of management compensation, thus, §4.2.4 of the code (GCGC 2005) states:

*"Compensation of the members of the Management Board shall be reported in the Notes of the Consolidated Financial Statements subdivided according to fixed, performance-related and long-term incentive components. The figures shall be individualized."*

Since the Code's adoption in 2002, empirical evidence shows that several companies did not comply with §4.2.4 of the GCGC<sup>8</sup> (Werder et al. 2005). The German parliament was quite unsatisfied with the companies' resistance regarding §4.2.4 of the GCGC. Thus, in 2005 they implemented the VorstOG, which became effective in 2006.

According to the VorstOG each stock listed company is now obliged to disclose individualized information on executive compensation in the notes of their financial statements differentiated into fixed and variable components, as well as components with long-term incentives. Henn et al. (2009) summarize that, due to the implementation of the VorstOG, German legislation was extended by (1) the mandatory disclosure of stock options and (2) the mandatory compensation disclosure by name.

With the implementation of the VorstOG several German lawyers and politicians postulated that the "new" mandatory disclosure of executive compensation could serve as an instrument to improve the representation of shareholders' interests in the compensation setting process. Furthermore, higher transparency, especially on an individualized level, could cause an outrage constraint towards managers not to request an inappropriately high remuneration. On top of this companies paying a relatively high level of executive compensation are likely to be

<sup>7</sup> From then on the code was reviewed annually.

<sup>8</sup> Werder et al. (2005) observe companies' compliance from 2002 until 2004.



in the focus of the media. Media attention in turn could exert public pressure on those companies which currently pay relatively high compensation packages. Next, based on the current literature we are going to stress the stated approaches and develop two hypotheses on the potential effects of the VorstOG on German executive compensation.

### **3 Literature and Hypothesis Development**

#### **Disclosure obligations as a monitoring tool for shareholders**

It is often stated that greater compensation transparency should motivate the (supervisory) board members to serve the purpose for which the board was originally created, namely to set the executive compensation in the shareholders' interest. Thus, a main function of mandatory disclosure laws is to enhance a board's effort in designing efficient management contracts. The efficient design of executive compensation in turn will minimize agency costs. (Vesper-Gräske (2010), Lo (2003), Alarie (2003)).

By analyzing the effects of new disclosure rules in America<sup>9</sup> for instance, Murphy (1996) detects empirically that firms adopt compensation packages that reduce realized levels of compensation.

Andjelkovic et al. (2002) postulate that due to the announcement of new publication obligations in New Zealand directors should be motivated to fulfill more actively the task of designing an efficient monitoring of executive pay. Indeed, the authors find empirically that in response to new disclosure requirements firms, or their directors, introduce reforms such as the implementation of a remuneration committee or stock/option incentive pay scheme in order to enhance the efficiency of executive compensation.

Accordingly, Lo (2003) formulates a "governance improvement hypothesis" which argues that extensive compensation disclosures could improve compensation contracts by reducing frictions between shareholders and managers. Using American data the author indeed estimates that the expansion of compensation disclosure results in value-increasing governance improvements<sup>10</sup>.

Craighead (2004) et al. find that in the absence of disclosure obligations pay-sensitivity in widely held firms is lower than in closely held firms. After the implementation of mandated disclosure the performance-related part of executive compensation increases more in widely held firms than in closely held firms. Especially in cases of widely held companies (where monitoring is more difficult) shareholders face high cost in order to understand and influence

---

<sup>9</sup> In 1992 companies were required to report the value of options granted to the CEO during the year.

<sup>10</sup> Lo (2003) shows that companies lobbying for disclosure obligations experienced high stock returns. However, companies lobbying against disclosure regulations experienced an even higher improvement of firm performance relative to control firms.

the incentive structure of compensation packages. Thus, the implementation of disclosure obligations improved the representation of shareholders' interests especially in cases where monitoring is more difficult.

These studies provide international evidence that stricter publication obligations lead to shareholders' interests being more likely to be reflected in compensation packages – partly because the supervisory boards are now more actively engaged in efficient contract design.<sup>11</sup>

According to German legislation the primary objective of the VorstOG is to assure the possibility of identifying whether German management compensation is reasonable. The degree of reasonableness – rather loosely defined – depends on the manager's tasks as well as the company's economic condition. The German parliament explicitly stated that publication obligations are particularly important for shareholders (Deutscher Bundestag 2005) and are assumed to improve investors' protection.

As mentioned earlier, the German two tier board system is based on a supervisory board that autonomously determines executive compensation. The annual general meeting is the only point in time when supervisory board members might have to justify their compensation decision before the shareholders. Prior to the introduction of VorstOG, the only information available to shareholders was the aggregated sum of executive compensation with no indication of variable versus fixed components or the distribution of the total amount between the members of the management board.

With the implementation of the VorstOG several German lawyers expected improved opportunities to evaluate the adequacy of the design and level of the current system of executive compensation. This may be realized by improving shareholders' monitoring possibilities, especially regarding the supervisory board members' duty to set reasonable and efficient executive compensation (Baums 2005, Hoffmann-Becking 2005, Fleischer 2005). Thus, Baums (2005) regards mandatory disclosure rules as a monitoring tool.

Summarizing, one possible intention of the VorstOG is to put supervisory boards under pressure to adjust inadequate compensation packages in order to serve the interests of the shareholders<sup>12</sup>. However, aside of closer monitoring by shareholders the following concept of

---

<sup>11</sup> There are several studies analyzing the impact of firms' negative media coverage (concerning CEO pay packages) and subsequent shareholder voting on say-on-pay resolutions. A recent study of Hooghiemstra et al. (2015) for example shows that negative media attention significantly affects subsequent shareholder discontent over say on pay. These results underline that shareholders' willingness to criticize and thus influence management compensation depends largely on the degree of information they receive about the supervisory board's decisions (either via media or directly via annual reports).

<sup>12</sup> Supervisory board members could fear shareholders' tools such as the inducement of their dismissal, the refusal of their reappointment or in the worst case financial penalties (Vesper-Gräske, 2010).

an “outrage constraint” might explain another leveling mechanism on executive compensation if such remuneration levels become more transparent.

### **Outrage constraint due to higher transparency**

In contrast to standard principal agent theory Bebchuk and Fried (2004) emphasize the role of managerial power as an explanation for inefficient contracts between agents and principals and the possibility of managers to influence their own pay arrangements<sup>13</sup>. However, so called “outrage constraints” are able to limit a managers’ rent maximization and the authors mention three reasons for the effects of outrage constraints:

Firstly, institutional investors may think due to outrageous compensation arrangements that executives are insensitive to shareholders’ interests. Thus, in the event of a hostile takeover or proxy fight, investors might be less motivated to support managers.

Secondly, regarding future market career prospects and current business dealings with outsiders, managers have an interest in avoiding reputational losses due to outrageous compensation arrangements.

Thirdly, social and psychological factors – such as criticism or ridicule from social or professional groups – discourage managers from adopting outrageous compensation arrangements.

Bebchuk and Fried (2004) summarize that “for executives to be adversely affected in a material way, outrage must spread among those outsiders whose views matter most to them: the institutional investor community, the business media, and social and professional groups” (Bebchuk and Fried (2004, 66)). Similarly, organizational behavior research states that due to self-serving motivation individuals tend to be unfair in reallocating resources. However, individuals change their self-serving behavior in cases where their allocation decisions were made public (Diekmann, 1997).

Dyck and Zingales (2002) empirically focus on the effect of media pressure on managers to behave according to social norms. They state that media attention affects managers’ reputations not only in the eyes of shareholders and future employers but also in the eyes of family, friends and professional associates. Thus, the responsiveness of managers to

---

<sup>13</sup> The idea of managers influencing their own compensation can certainly be applied to the German corporate governance system. Although the two tier system implements supervisory boards as an autonomous institution responsible for management compensation, literature provides evidence of the supervisory boards’ inefficiency (i.e. Oehmichen et al. (2014), Kramarz and Thesmar (2013), Andres et al. (2013)). Particularly in cases where board members have friendly relationships (interlocking boards) it is likely that managers will indirectly receive managerial power to influence their own pay arrangements.

environmental issues – which they examine empirically<sup>14</sup> – is partly due to concern about their public image. Kuhnen and Niessen (2012) on the other hand investigate the direct impact of public opinion on executive compensation in America and find empirical evidence that public opinion influences a firms’ decision on the composition of executive compensation. Subsequent to negative press coverage of CEO compensation, firms adjust the level and structure of executive compensation<sup>15</sup> and this effect intensifies in firms having executives with stronger reputational concerns. Alissa (2015) examines empirically the compensation-based board response to shareholders’ dissatisfaction<sup>16</sup>. He argues that, assuming shareholders’ dissatisfaction damages the managers’ reputations, managers might have an incentive to avoid further shareholder dissatisfaction by systematically reducing excess pay. However, a significant systematic pay-based reaction only occurs in cases of poor firm performance<sup>17</sup>.

Häring and Douglas (2012) provide evidence for the management compensation reducing effect of an outrage constraint by presenting a German example from the financial crisis. Although the economy was going through a financially difficult period, executives still received high compensation packages. For obvious reasons this caused outrage which made the CEO of Deutsche Bank, Josef Ackermann, “voluntarily” waive his bonus shortly before the bank announced a record loss in 2008. Similar behavior by U.S. American CEOs has been observed as well.

Detailed disclosure obligations regarding executive compensation lead to higher transparency and the general public receives the necessary information on compensation arrangements which could possibly induce outrage. Thus, Bebchuk and Fried (2004, 192) state that “the greater outsiders’ understanding of compensation arrangements, the tighter the outrage constraint”<sup>18</sup>.

Applied to the German context, several German lawyers hypothesized that disclosure of executive compensation by name might prevent executives from postulating inappropriately high compensation packages and therefore lead to a leveling effect of total compensation.

---

<sup>14</sup> The authors use international data.

<sup>15</sup> They observe a reduction in option pay and an increase in other compensation components such that overall compensation does not change.

<sup>16</sup> Measurement of dissatisfaction is possible due to the implementation of the Say on Pay regulation in the UK in 2002 that allows shareholders to vote against a firm’s Directors’ Remuneration Report.

<sup>17</sup> Thus, boards respond selectively to shareholders’ dissatisfaction when there is poor performance. Alissa (2015) mentions two potential reasons for the lack of evidence in cases where performance is not bad: Firstly, the remuneration board might fear the loss of a valuable CEO in cases of wage reduction. Secondly, shareholders’ dissatisfaction may influence certain elements of compensation which do not capture pay levels.

<sup>18</sup> However, Bebchuk and Fried (2004) point out that disclosure only succeeds in constraining compensation effectively if the information is available to more than just a selected group.

(Baums 2005, Hoffmann-Becking 2005, Fleischer 2005). Hoffmann-Becking (2005) and Hirte (2003) point to the particular sensitivity in Germany to high compensation levels (probably of higher relevance than e.g. in the U.S.) which might even intensify the disciplining effect of an outrage constraint in the German context. According to Baums (2005) disclosure partly serves as a “prevention tool” that discourages executives from claiming inappropriately high compensation packages, such that the individual compensation disclosure by name might have a leveling effect on inappropriately high compensation levels.

So far we have described two mechanisms which both predict a leveling effect of stricter publication obligations on executive compensation. On the one hand, we claimed that disclosure obligations might serve as a monitoring tool for shareholders which might motivate supervisory board members to adopt executive compensation that reflects the shareholders’ interests. On the other hand, there might be an outrage constraint exerting pressure on executives which could discourage them from claiming inappropriately high compensation levels. Not least, it might well be that both mechanisms occur simultaneously. Thus we hypothesize:

***H1:** Higher transparency concerning executive compensation due to implementation of the VorstOG might intensify shareholders’ possibilities in monitoring the supervisory board’s compensation setting and/or an outrage constraint on managers. Therefore the implementation of the VorstOG should have a leveling (negative) impact on total (excessive) compensation.*

### **Sensationalism – the public tends to focus on high compensation levels**

As mentioned above, recent literature discusses the impact of media on corporate governance. Not only outsiders with particular interests and relations to companies, but also the media receive better information on executive compensation as a result of stricter disclosure obligations. Taking into account that shareholders’ willingness to criticize and thus influence management compensation depends largely on the degree of information they receive, media on the one hand serves as an additional instrument for reporting governance issues. That in turn may intensify the former mentioned mechanism of disclosure obligations as a monitoring tool (Hooghiemstra et al. (2015)). On the other hand, negative media coverage of executive compensation could damage the executives’ reputation and thus set up an outrage constraint as discussed above.

Besides this, there is evidence that media tend to focus on companies paying a particularly high level of executive compensation. For instance, Core et al. (2008) showed empirically that negative press coverage on management compensation is related to the level of compensation, in particular the excessive part of compensation. Similarly, Chen et al. (2013) provide evidence that media coverage in China is much wider for firms with high executive compensation. One reason for this phenomenon could be the preference of the press for engaging in sensationalism. The higher the gap between average worker wages and executive compensation, the more spectacular the news<sup>19</sup>.

Accordingly, companies in the upper part of compensation distribution are more likely to receive public attention than companies with a relatively low compensation level. This hypothesis is probably particularly relevant for Germany, where high income levels are always considered suspicious by some people, irrespective of the performance and responsibility of CEOs. The implementation of the VorstOG is explicitly associated with higher transparency and could therefore cause an intensification of this phenomenon. Vesper-Gräske (2010) postulates an implicit intention of the VorstOG to limit high executive compensation by means of media publicity. Consequently, there might be higher public pressure, especially in the upper part of compensation distribution due to new publication obligations.

Thus we formulate the following hypothesis:

***H2: Companies in the upper part of the compensation distribution are more likely to be the focus of media attention and thus experience higher media pressure. Consequently, the effect of higher publication obligations on compensation levels should be stronger in the upper part of the compensation distribution.***

So far we would expect a negative impact of publication obligations on (inappropriately high) management compensation and thus a positive governance mechanism. However, the literature also critically discusses a possible increase in compensation level due to stricter publication obligations. Higher transparency and thus more detailed information about a rival company's compensation might justify a higher pay level. The so called "ratcheting-up" effect

---

<sup>19</sup> Hooghiemstra et al. (2015) differentiate between media coverage in the financial and business press and media coverage in the general press. Thus, depending on the type of press, media could serve either as an information intermediary or as an instrument of entertainment. Core et al. (2008) support the sensationalism argument by showing that the press focuses negative attention on executives with particular large option exercises.

describes an inflationary growth of executive compensation because boards might tend to set executive remuneration at a level that is slightly above the average in their industry.

There is much debate as to whether this effect is efficient or not. On the one hand, benchmarking could lead to an inefficient increase in executive pay in cases where remuneration is orientated toward the compensation paid at other companies, but neglecting many of the specific circumstances confronting a particular firm (Alarie 2003). On the other hand, benchmarking could serve as an efficient mechanism to detect the reservation wage in order to get the best managers (Bizjak et al. (2008))<sup>20</sup>. However, Bizjak et al. (2011) report that firms (opportunistically) tend to target pay at higher percentiles than the median of the peer group or simply favor peer firms with higher compensation levels. Even after changes in disclosure regulation in the US in 2006<sup>21</sup>, which required American companies to disclose their compensation to peer group members, Faulkender et al. (2013) find that strategic peer benchmarking did not disappear and was sometimes even intensified.

Besides the evidence for an inflationary effect of peer benchmarking on management compensation in general there is (to our best knowledge) no empirical evidence for a positive causal connection between mandatory compensation disclosure and executive compensation<sup>22</sup>. Although Perry and Zenner (2001) state that the real compensation levels increased dramatically in the period following compensation disclosure obligations in the US, the authors admit that the rise in stock option grants contributes to a large degree to these increases. Nevertheless, the conclusion of the authors is that executive compensation did not decline at all.

Finally, Baums (2005) doubts that information on rival companies' remuneration and thus the inflationary effect of peer benchmarking is a consequence of the implementation of publication obligations. He argues that experts of executive compensation consulting firms, which usually consult remuneration committees in the US, are well aware of competitors' remuneration systems, even without mandatory publication obligations. The same is true for Germany and the relevance of a ratcheting-up effect of executive compensation due to publication obligations might be limited for other reasons.

---

<sup>20</sup> Indeed, the authors find out empirically that benchmarking and the use of peer groups is widespread in setting management compensation. In detail they show that executives receiving compensation packages below the median experience a larger increase in compensation than executives receiving compensation packages above the peer group median. Furthermore, the authors find evidence that the increase in compensation from below to above average is not systematically associated with poor corporate governance.

<sup>21</sup> Implementation of the 2006 Securities and Exchange Commission (SEC) rule

<sup>22</sup> In a recent working paper Balsam et al. (2015) analyze the effect of adopting International Financial Reporting Standards (IFRS) on executive compensation. They show that after IFRS adoption executive pay increases significantly. However, by focusing on the impact of general IFRS adoption and not on compensation disclosure obligations these results must be seen in another context and are not contradictory to our argumentation.

## **4 Data and identification strategy**

### **4.1 Identification Strategy**

The aim of our analysis is to evaluate the impact of a natural experiment, in particular the implementation of the VorstOG, on the level of executive compensation. A standard approach in program evaluation is the difference-in-differences (DID) estimator. Basically, a DID approach compares the impact of a “treatment” (in our case the policy intervention) before and after the treatment by simultaneously considering a cross-sectional component. The cross-sectional component is provided by a basic differentiation between a so called treatment group and a control group. In our case the treatment group represents the group of companies which are affected by the policy change. That is the group of companies which did not voluntarily disclose the executive compensation before the implementation of the VorstOG. Consequently, the group of controls is defined by companies which disclosed executive compensation voluntarily even before it became mandatory by law. Now the basic idea is to estimate the change experienced by the treatment group adjusted by the change realized by the control group before and after the treatment.

Thus, in the following we will compare the level of executive remuneration before and after the implementation of the VorstOG, between companies which did not voluntarily disclose (treatment group) and companies which had already voluntarily disclosed (control group) remuneration before this became mandatory.

Fortunately we are able to differentiate between treatment and control group by using information from the declaration of compliance to the GCGC. Thus, the sample forming our treatment group consists of those firms which did not comply with §4.2.4 of the GCGC in 2005. As mentioned earlier, these are companies which refused to disclose executive compensation components on a differentiated and individualized level. The pre-reform cohorts consist of observations from before 2005 (including 2005)<sup>23</sup>. Since the VorstOG became effective in 2006 the post-reform cohort is represented by observations after 2005.

### **4.2 Econometric model**

The standard DID estimator calculates the average effect of the intervention on the treatment group<sup>24</sup> (Athey and Imbens (2006)). In order to do so it is necessary to calculate the counterfactual outcome of the treatment group. This is the outcome that the treatment group

---

<sup>23</sup> Due to data restrictions we assume that companies which did not comply in 2005 with paragraph 4.2.4 GCGC also did not comply with the same paragraph in previous years.

<sup>24</sup> Given that the common trend assumption and independence assumption is fulfilled. Note that result depends on scaling of the outcome.



would have achieved if the treatment group had not been treated. Once the counterfactual outcome is calculated it has to be subtracted from the post treatment outcome of the treatment group in order to identify the treatment effect on the treated. Given the common trend and independence assumption is fulfilled the counterfactual situation can be easily calculated. Therefore we assume that  $E(y_{GT})$  represents the conditional expected outcome, whereas the index  $GT$  indicates whether the outcome is realized by the treatment group ( $G = 1$ ) or not ( $G = 0$ ) and simultaneously indicates the time period which is either the post treatment period ( $T = 1$ ) or not ( $T = 0$ ). The expected value of a counterfactual outcome is denoted by  $E(Y_{GT}^N)$ . Formally the counterfactual expected value of the treatment group's outcome  $E(Y_{GT}^N)$  is defined as follows:

$$E(Y_{11}^N) = E(Y_{10}) + E(Y_{01}) - E(Y_{00}) \quad (1)$$

The DID effect can then be computed by<sup>25</sup>:

$$\Delta DID = E(Y_{11}) - E(Y_{11}^N) \quad (2)$$

Aside of the general effect, in several cases it might be of interest to learn more about a particular treatment effect, especially when the effect of an intervention might differ across individuals or quantiles. With regard to the current research question it might well be the case that the implementation of the VorstOG has different effects on executive compensation depending on the quantiles of the distribution which are examined. Therefore, the Quantile-DID (QDID)<sup>26</sup> approach is used, which applies the standard DID approach to each quantile rather than to the mean (Athey and Imbens 2006).

In order to calculate treatment effects on different quantiles instead of at the mean we need to consider the conditional distribution function of our outcome variable,  $F_{GT}(y)$ . Again, the index  $GT$  differentiates between treatment and control group, respectively between post and pre-treatment. Within a QDID approach it is now necessary to fix a certain quantile  $\tau'$  for a specific outcome  $y'$  depending on the conditional distribution of the pre-treatment group ( $F_{10}(y')$ ) (see Figure 1). Based on this quantile the counterfactual outcome distribution of the treatment group ( $F_{11}^N(y)$ ) will be computed. Similarly to the standard DID this is done by adding the difference between  $F_{01}(y)$  and  $F_{00}(y)$  to  $F_{10}(y)$  for a particular quantile  $\tau'$ .

<sup>25</sup> This difference is equivalent to  $(E(y_{11}) - E(y_{01})) - (E(y_{10}) - E(y_{00}))$  which perhaps more intuitively refers to the idea of a difference-in-differences estimator.

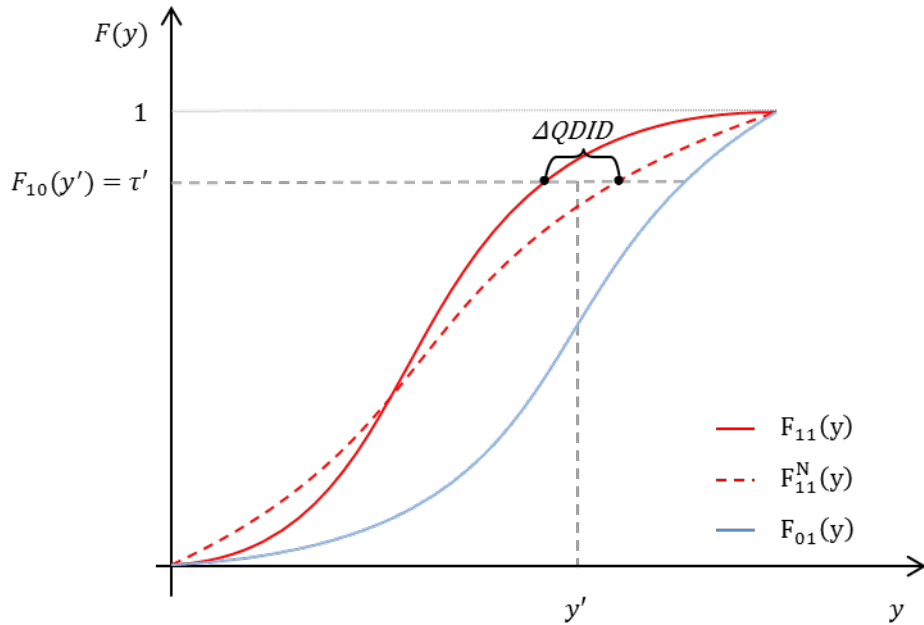
<sup>26</sup> Also called non-linear DID method

Formally this can be expressed by using inverse distribution functions (also known as quantile functions), such that:

$$F_{Y,11}^{-1N}(\tau') = F_{Y,10}^{-1}(\tau') + (F_{Y,01}^{-1}(\tau') - F_{Y,00}^{-1}(\tau')) \quad (3)$$

Figure 1 shows that the treatment effect  $\Delta QDID$  finally results in the difference between the actual and the counterfactual distribution of the treatment group on a certain quantile  $\tau'$

$$\Delta QDID = F_{Y,11}^{-1}(\tau') - F_{Y,11}^{-1N}(\tau') \quad (4)$$



**Figure 1: Quantile Diff in Diff – Treatment Effect**

Only post-treatment outcome distribution functions are shown;  $F_{11}(y)$  represents conditional distribution of  $y$  of the post-treatment group;  $F_{11}^N(y)$  represents counterfactual conditional distribution of  $y$  of the post-treatment group;  $F_{01}(y)$  represents conditional distribution of  $y$  of the post-control group.

The treatment effect at the  $\tau'$ -quantile is  $\Delta QDID = \theta_{\tau'}$  and can be easily estimated using standard quantile regression<sup>27</sup> by application of the following specification

$$F_Y^{-1}(\tau') = \alpha_{\tau'} + \beta_{\tau'}T + \eta_{\tau'}G + \theta_{\tau'}GT + \mathbf{X}'\gamma_{\tau'} \quad (5)$$

The explanatory variables  $T$  and  $G$  correspond to the index description definition explained above. The vector  $\mathbf{X}'$  represents a set of controls. Thus the QDID approach compares

<sup>27</sup> Koenker and Basset (1978); Chamberlain, G. (1994), Koenker, R. (2005)

individuals across both groups and time periods according to their specific quantile (Athey and Imbens 2006)<sup>28</sup>.

Unfortunately, standard quantile regression, often referred to as conditional quantile regression, only provides the effect of changes in an explanatory variable on the conditional distribution of the dependent variable. Thus, the interpretation of the coefficients is only valid for the corresponding quantile of the distribution which is defined by the covariates (conditional distribution)<sup>29</sup>. In the context of this study this means that the estimated treatment effect, for example at the median, represents the treatment effect for companies that pay the median compensation which is defined by whatever covariates we include in the model (Porter, 2015). Thus the estimated treatment effect of disclosure obligations using conditional quantile regression represents the treatment effect within a group, where the “group” consists of companies who share the same values of the covariates.

However, empirical researchers are primarily interested in understanding the effect of a change in an explanatory variable on the unconditional distribution of the dependent variable. That is the treatment effect on a certain quantile of the overall compensation distribution. Especially in cases of evaluating policy interventions quantile effects for an unconditional population might be more interesting.

Thus, following Havnes and Mogstad (2015) we extend the idea of the QDID approach explained above to an unconditional quantile DID approach. Basically, this approach uses the concepts of influence functions (IF)<sup>30</sup> respectively recentered influence function (RIF) in the manner of Firpo et al. (2009) and adapts this technique to a DID framework.

Firpo et al. (2009) developed the RIF regression model which in the case of quantile analysis can be interpreted as unconditional quantile regression. The main idea is to evaluate the impact of changes in the explanatory variable on the unconditional distribution of the dependent variable. To do so we first need to transform the dependent variable into the RIF such that we can run a regression of the RIF on the explanatory variables. The RIF is defined as the sum of the IF and the value of the dependent variable at the  $\tau$ th quantile ( $q_\tau$ ) such that:

---

<sup>28</sup> In contrast to standard DID the QDID framework makes independence of explanatory variables necessary (the underlying distribution of unobservable characteristics must be identical in all subpopulations). Restriction on data is that the transformation  $k^{QDID}(y) = y + \Delta QDID$  is monotone. Furthermore the identifying assumption depends on monotonic transformations of the outcome variable (Athey and Imbens 2002).

<sup>29</sup> In contrast to standard OLS regression an estimated coefficient  $\beta_\tau$  from a conditional quantile regression is generally different from the estimated coefficient measuring the effect of changing an  $X$ -variable on the  $\tau$ th quantile of the unconditional distribution of  $y$  (Firpo et al. 2009).

<sup>30</sup> The influence function estimates the marginal effect of an observation on the value of a statistic. The influence function is frequently used in the literature on robust estimation as a measure of robustness to outliers.

$$RIF(Y; q_\tau, F_y) = q_\tau + IF(Y; q_\tau, F_y) \quad (6)$$

In a next step we will model the conditional expectation of the RIF as a linear function of the explanatory variables  $X$  such that we can run simple OLS in order to estimate the coefficient  $\beta$  in an unconditional quantile regression framework.

$$E(RIF(Y; q_\tau, F_y)|X) = X'\beta + \varepsilon \quad (7)$$

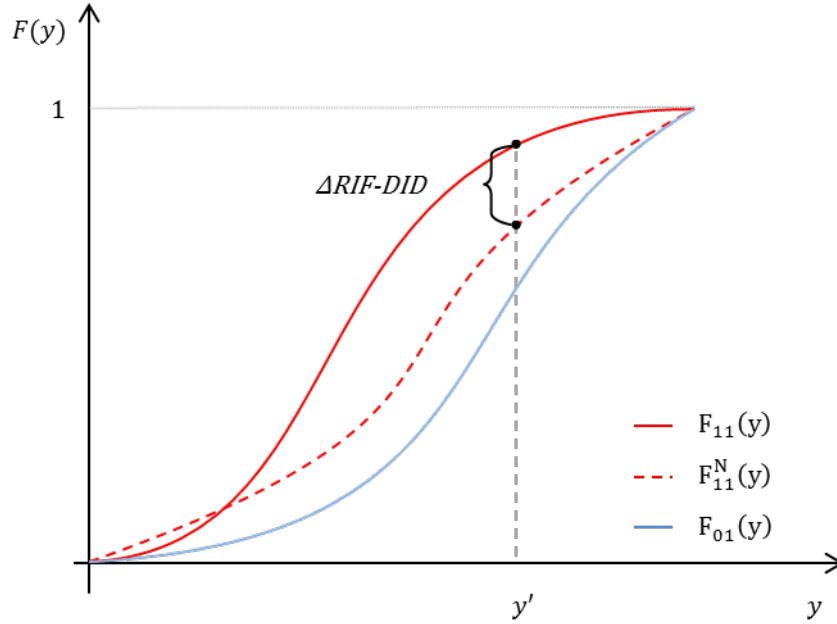
Firpo et al. (2009) showed that the average derivative of this unconditional quantile regression provides the marginal effect on the unconditional quantile of a small location shift in the distribution of covariates *ceteris paribus*. Thus, the interpretation of the estimated coefficients is similar to the interpretation of OLS estimates. Due to the transformation of the dependent variable into the RIF without considering any covariates the interpretation of the estimated coefficients is independent of covariates – or “unconditional”, so to speak.

As already mentioned, Havnes and Mogstad (2015) used the concept of RIF regression and extended it to the DID context. Similar to QDID, it is necessary to construct a counterfactual distribution of the post-treatment output of the treated group. Thus, in order to identify  $F_{11}^N(y)$  in the RIF-DID context the model adds to the  $F_{10}(y)$  distribution the difference of the distributions of  $F_{01}(y)$  and  $F_{00}(y)$  such that:

$$F_{11}^N(y) = F_{10}(y) + (F_{01}(y) - F_{00}(y)) \quad (8)$$

Consequently the treatment effect  $\Delta RIF - DID$  results by subtracting  $F_{11}^N(y)$  from  $F_{11}(y)$  as can be seen in Figure 2.

$$\Delta RIF - DID = F_{11}(y) - F_{11}^N(y) \quad (9)$$



**Figure 2: RIF- Diff in Diff – Treatment Effect**

Only post-treatment outcome distribution functions are shown;  $F_{11}(y)$  represents conditional distribution of  $y$  of the post-treatment group;  $F_{11}^N(y)$  represents counterfactual conditional distribution of  $y$  of the post-treatment group;  $F_{01}(y)$  represents conditional distribution of  $y$  of the post-control group.

The unconditional treatment effect  $\Delta RIF - DID = \delta_\tau$  can then be calculated by estimating the following specification via RIF regression.

$$E(RIF(Y; q_\tau, F_y)|X) = \alpha_\tau + \beta_\tau T + \eta_\tau G + \delta_\tau GT + \mathbf{X}'\gamma_\tau \quad (10)$$

Similar to the standard DID<sup>31</sup> approach, there are also underlying identifying assumptions for non-linear DID methods. In the QDID framework, for example, the common trend assumption in mean earnings in the absence of the treatment needs to be fulfilled. That means that given a certain quantile  $q'_\tau$  the change in the outcome variable for the treatment group (from before to after treatment period) would have been the same as for the control group if the treatment group had not been treated.

In contrast to this, the common trend assumption in the RIF-DID context is slightly less restrictive. There it is only necessary that the change in population shares (from before to after treatment period) *around a certain  $y'$*  would have been the same as for the control group if the treatment group had not been treated (Havnes and Mogstad (2015)).

<sup>31</sup> In comparison to standard DID the non-linear DID approaches are invariant to monotonic transformation of the outcome.

### 4.3 Data

In order to evaluate the effect of the implementation of mandatory publication obligations in Germany on executive compensation we use a composed dataset of 84 German companies which are listed on the Prime Standard segment of the German Stock Exchange<sup>32</sup>. The dataset covers the periods from 2002 to 2011 (unbalanced) resulting in a total number of 762 observations<sup>33</sup>. Data on the average executive compensation per head is provided by Kienbaum Consulting. Furthermore, we combine the Kienbaum dataset with the Dafne database compiled by Bureau van Dijk. This dataset contains information on firm financials and firm employment which will serve as control variables. Beside this we use self-collected data on the disclosure practices of the companies. For this purpose we evaluated the annual declaration of compliance for the financial year 2005. In detail we noted which companies complied voluntarily and self-obliged with paragraph 4.2.4 of the German Corporate Governance Code in 2005 and which companies did not.

Table 1 presents descriptive statistics of our data separated into control and treatment group. Accordingly we observe 51 (484 firm-years) companies which refuse to apply the recommendation of paragraph 4.2.4 of the Corporate Governance Code and thus according to our identification strategy serve as the treatment group. Consequently, the 33 (278 firm-years) remaining companies that had already complied with paragraph 4.2.4 before the implementation of mandatory publication obligations became effective therefore form the control group.

Our dependent variable  $y$  is the logarithm of the average total compensation per head ( $\ln TotComp$ ). The average total executive compensation per head is €1.5m in the control group and greater than the corresponding amount of €1.05m for the treatment group. As the standard deviation for the average total compensation in the control group is also higher we know that the difference in total compensation between treatment and control group is rather driven by outliers than by systematic differences.

Both estimation techniques, QDID and RIFF-DID, use the same explanatory variables. Referring to equations (5) and (10) the variable  $T$  represents a dummy variable assuming unit value if the observation is from the year 2006 onwards (including the year 2006) and zero if the observation belongs to the pre-treatment period. The dummy variable  $G$  indicates whether an observation belongs to the treatment group (unit value) or to the control group. The (quantile) treatment effect will be represented by the coefficient  $\theta_\tau$  and  $\delta_\tau$  respectively.

---

<sup>32</sup> Most of the companies have been quoted either on the DAX or the MDAX.

<sup>33</sup> We only kept observations for which we have information before and after the treatment.

As mentioned earlier,  $\mathbf{X}'$  represents a vector of controls. In particular, we control for size effects by using the log of employment (*lnEmploy*). Table 1 shows that the average company size of the control group is 65.841 employees and therefore these firms are much larger than those from the control group, which employ on average 17.019 persons. Similar to the dependent variable, the standard deviation of the mean value for *Employ* is much higher in the control group than in the treatment group. Thus, we conclude that this difference in size is mostly driven by some extremely large companies in the control group (for example Volkswagen AG). This makes clear that in order to estimate a causal treatment effect it is important to control for possible size effects.

The impact of economic performance is considered by using return on equity (*ROE*) as an explanatory variable. The average return on equity for both groups varies between 7 and 8 percent. Furthermore, we control for an asymmetry in punishing managers for bad firm decisions and remunerating managers for good firm decisions by implementing a dummy variable that assumes unit value if the balance sheet total is positive and zero otherwise (*DProfit*). More than 80 percent of the overall observations include companies which have a positive balance sheet total. Additionally, we control for the asymmetric impact of performance on compensation by interacting *DProfit* with *ROE*. The average return on equity for companies having a positive balance sheet total (12.53%) is slightly higher in the treatment group than the corresponding value for the control group (10.38%). As we use an unbalanced panel for the periods between 2002 and 2011 we control for time effects by implementing time dummies. We also control for industry effects by using industry dummies<sup>34</sup>.

**Table 1: Descriptive Statistics for 2002 - 2011 for treatment and control groups**

	Variable	N	Mean	Se
Control group (G = 0)	<i>TotComp</i>	278	1557	1413
	<i>ROE</i>	278	7.107	18.04
	<i>Employ</i>	278	65841	111485
	<i>DProfit</i>	278	0.838	0.369
	<i>intDProfitROE</i>	278	10.38	8.964
Treatment Group (G = 1)	<i>TotComp</i>	484	1048	1076
	<i>ROE</i>	484	8.097	22.59
	<i>Employ</i>	484	17019	47088
	<i>DProfit</i>	484	0.841	0.366
	<i>intDProfitROE</i>	484	12.53	11.67

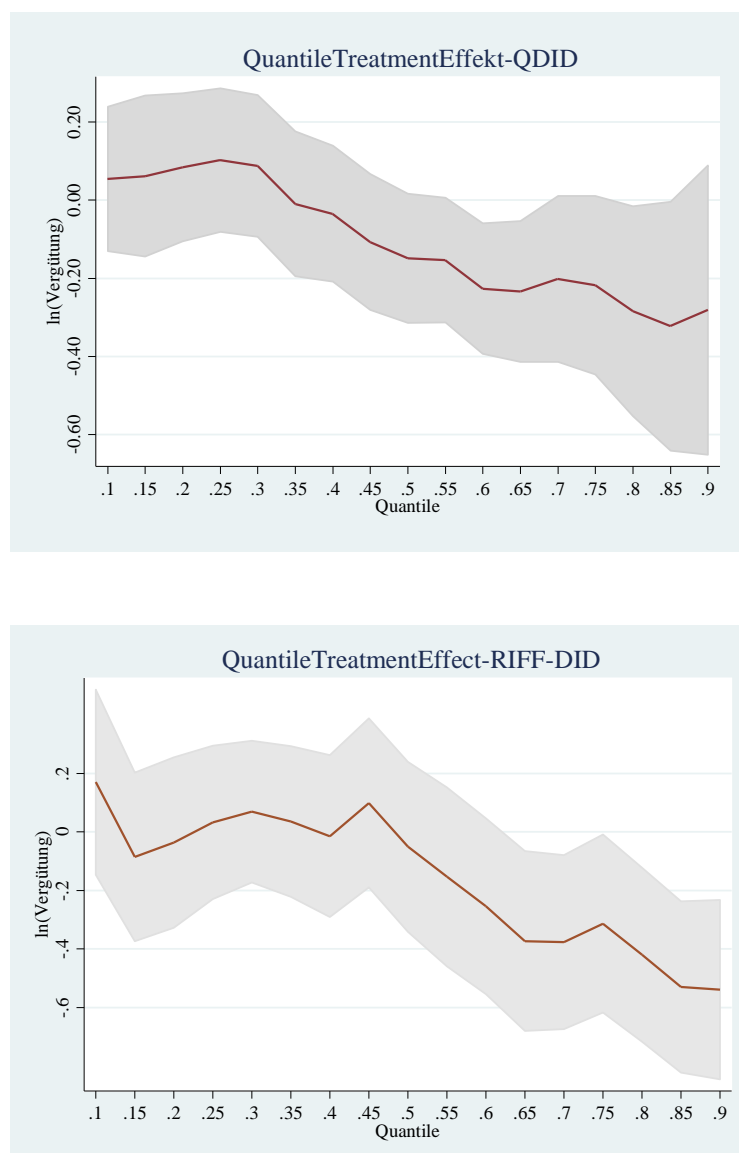
TotComp represents total per head executive compensation in thousand Euros. (84 companies from 2002 to 2011)

<sup>34</sup> WZ2008 first stage (“Klassifikation der Wirtschaftszweige“ from Statistisches Bundesamt)

## 5 Results

As described in equations (5) and (10) we run the QDID and the RIF-DID estimator on identical specifications such that the set of independent variables and the number of observations is the same for both models.

Figure 3 represents the estimated treatment effects for both models. The horizontal consists of quantiles ranging from the 10<sup>th</sup> to 90<sup>th</sup> quantile and the vertical represents the logarithm of the total compensation per head. Thus, the graph represents the percentage effect of the implementation of the VorstOG on the different quantiles of the compensation distribution.



**Figure 3: Quantile treatment effect of the VorstOG on the log level of executive compensation per head**  
 The plotted QTE corresponds to the estimator for  $\theta_{\tau}(\delta_{\tau})$  in equation (5) (equation (10)) in the QDID (RIF-DID) case. As it is not recommended to push  $\tau$  into the tails too far we only present the QTE at quantiles 01-90. The grey shaded area represents a 90% confidence interval based on bootstrap with 200 replications.



As presented in Figure 3 the similar shape of both curves (QDID and RIF-DID) indicates that our results are robust towards different estimation techniques whereas the point estimates of the RIFF-DID estimation are in absolute values higher than those of the QDID model. Both estimation techniques show a decreasing trend in the point estimates of the treatment effect along the quantiles. This serves as an indicator that the treatment effect differs across quantiles such that a quantile regression in general seems to be an adequate estimation technique to evaluate the effect of the implementation of VorstOG.

According to the QDID results, the implementation of the VorstOG caused a decrease of 23 percent in total compensation if the 65<sup>th</sup> quantile of the compensation distribution is considered and a decrease of 32 percent if the 85<sup>th</sup> quantile is analyzed. When unconditional quantile estimation techniques are used it turns out that the effects are even more extreme. If this method is applied in the case of the 65<sup>th</sup> quantile the VorstOG causes a 37 percent decrease in total compensation and for the 85<sup>th</sup> quantile the estimated treatment effect is a decrease of 53 percent in comparison to the control group.

However, in both cases the estimated effects turn out to be significant only in the upper quantiles. Thus, between the 60<sup>th</sup> and 90<sup>th</sup> quantile the implementation of publication obligations in Germany has a significant negative effect on the total per head executive compensation.

In comparison to companies who already disclosed executive compensation on a detailed level voluntarily before the implementation of the VorstOG, companies who did not disclose information experienced a decrease in total compensation due to the mandatory changes in publication obligations. Thus, the fact that the estimated treatment effect in both models has a negative sign (at least at the part of the distribution where it turns out to be significant) supports H1. As we described earlier there might be two potential mechanisms which might (simultaneously) determine the revealed decrease in total executive compensation. The estimated results suggest that stricter publication obligation could possibly serve as an instrument to motivate supervisory board members to adopt total compensation schemes in accordance with shareholder' interests. The results also support the notion that, due to an outrage constraint, executives might be discouraged from claiming inappropriately high compensation packages, resulting in a decrease of total compensation.

There is no valid interpretation of the impact of the VorstOG on the lower part of the compensation distribution – perhaps due to the fact that there is no effect at all? Thus, the fact that the quantile treatment effects only turn out to be significant for the upper part of the

compensation distribution supports the earlier discussed assumption that the policy change might especially be effective in the case of inappropriately high levels of compensation (H2). Besides the fact that the treatment effect is only significantly estimated in the upper part of the distribution, the effect itself also increases in terms of absolute values. This might support our second hypothesis that media pressure, which mostly focuses on extremely high executive compensation, succeeded in having a stronger impact on higher levels of compensation.

## **6 Conclusion**

This paper reports the results of an empirical study on the effects of the introduction of considerably more stringent disclosure requirements on the level of executive compensation. The innovative aspect is the comparison of companies which voluntarily followed a recommendation of the German Governance Code (before the disclosure became mandatory) and published detailed information on executive compensation with others which did not. Furthermore, we apply a quantile difference-in-differences model and extend the analysis to unconditional quantile regression. Interestingly, the companies which refused to publish data before it became mandatory, show a reduction in compensation levels for the upper quantiles. Hence, the mandatory requirements to publish detailed information affected remuneration in the way that was intended by the legislator.

Since before the implementation of the VorstOG only the total amount of executive compensation was published and not its components, we do not know to which extent the decrease in total per head compensation is due to changes in the compensation design. A decrease in total compensation could be caused by different mechanisms: Firstly, it could be caused by a simple decrease in the fixed part of executive compensation holding other variable compensation components constant. Secondly, a decrease in the total level of compensation could occur because both fixed and variable parts decreased. Or thirdly (but most unlikely), the reason for a total decrease is a decrease in the variable share of compensation.

## Literature

- Alarie, B. (2003)**, “Executive Compensation and Tax Policy: Lessons for Canada from the Experience of the United States in the 1990s, in: University of Toronto Faculty of Law Review, vol. 61(1), p. 39-77.
- Alissa, W. (2015)**, “Board’s Response to Shareholders’ Dissatisfaction: The Case of Shareholders’ Say on Pay in the UK”, in: European Accounting Review, Vol. 24 Issue 4, p. 727-752.
- Andjelkovic, A., Boyle, G., McNoe, W. (2002)**, “Public disclosure of executive compensation: Do shareholders need to know?”, in: Pacific-Basin Finance Journal, vol. 10, p. 97-117.
- Andres, C., Van den Bongard, I., Lehmann, M. (2013)**, “Is Busy Really Busy? Board Governance Revisited”, in: Journal of Business Finance & Accounting, 40(9) & (10), p. 1221-1246.
- Baums, T. (2005)**, “Zur Offenlegung von Vorstandsvergütungen”, in: Zeitschrift für das gesamte Handels- und Wirtschaftsrecht, Heft 04, p. 299-309.
- Balsam, S., Gordon, E. A., Li, X. (2015)**, “Mandatory Disclosure Reform, Monitoring, and Executive Compensation, WP.
- Bebchuk, L., Fried, J. (2004)**, “Pay Without Performance – The Unfulfilled Promise of Executive Compensation”, Harvard University Press, Cambridge.
- Bitter, G. (2005)**, “Diskussionsbericht zu den Referaten Kramarsch, Martens und Hoffmann-Becking (Diskussionsleitung Prof. Dr. Dres. H.c. Karsten Schmidt)“, in: Zeitschrift für das gesamte Handels- und Wirtschaftsrecht, Heft 02-03, p. 181-184.
- Bizjack, J. M., Lemmon, M. L., Naveen L. (2008)**, “Does the use of peer groups contribute to higher pay and less efficient compensation?”, in: Journal of Financial Economics, vol. 90(2), p. 152-168.
- Bizjack, J. M., Lemmon, M. L., Naveen L. (2011)**, “Are all CEOs above average? An empirical analysis of compensation peer groups and pay design”, in: Journal of Financial Economics, vol. 100, p. 538-555.
- Core, J. E., Guay, W., Larcker, D. F. (2008)**, “The power of the pen and executive compensation”, in: Journal of Financial Economics, Vol. 88, p. 1-25.
- Chen, C.-W., Yi, B., Lin, J. B. (2013)**, “Media coverage, board structure and CEO compensation: Evidence from Taiwan”, in: Journal of Multinational Financial Management, Vol.23, p. 434-445.

- Chamberlain, G. (1994)**, “Quantile regression, censoring, and the structure of wages”, in: *Advances in Economics Sixth World Congress*, ed. Christopher A. Sims, p. 171-209. Cambridge University Press: Cambridge.
- Clarkson, P. M., Walker, J., Nicholls, S. (2011)**, “Disclosure, shareholder oversight and pay-performance link”, in: *Journal of Contemporary Accounting and Economics*, vol. 7, p. 47-64.
- Craighead, J. A., Magnan, M. L., Thorne, L. (2004)**, “The Impact of Mandated Disclosure on Performance-Based CEO Compensation”, in: *Contemporary Accounting Research*, vol. 12(2), p.369-398.
- Diekmann, K. A. (1997)**, “Implicit justification” and self-serving group allocations”, in: *Journal of Organizational Behavior*, vol. 18, p. 3-16.
- Deutscher Bundestag (2005)**, Drucksache 15/5577, 31<sup>st</sup> of May 2005, (BT-Drs. 15/5577).
- Dyck, A., Zingales, L. (2002)**, “The Corporate Governance Role of Media”, in: Roumeen Islam (ed), *The Rights to Tell: The Role of Media in Development*, p. 107-137, The World Bank, Washington DC.
- Essama-Nssah et al. (2013)**, “Accounting for Heterogeneity in Growth Incidence in Cameroon Using Recentered Influence Function Regression”, WP
- Faulkender, M., Yang, J. (2013)**, “Is Disclosure an Effective Cleansing Mechanism? The Dynamics of Compensation Peer Benchmarking”, in: *Review of Financial Studies*, vol. 26 (3), p. 806-839.
- Fernandes, N., Ferreira, M. A., Matos, P., Murphy K. J. (2013)** “Are US CEOs Paid More? New International Evidence”, in: *Review of Financial Studies* 26 (2), p. 323–367.
- Fleischer, H. (2005)**, “Das Vorstandsvergütungs-Offenlegungsgesetz”, in: *Der Betrieb*, Heft 30, p. 1611-1617.
- Fripo, S., Fortin, N.M., Lemieux, T. (2009)**, “Unconditional quantile regression”, in: *Econometrica*, vol. 77(3), p. 953-973.
- Häring, N., Douglas, N. (2012)**, “Economists and the Powerful: Convenient Theories, Distorted Facts, Ample Rewards”, Anthem Press, London, New York.
- Havnes, T, Mogstad, M. (2015)**, “Is universal child care leveling the playing field?”, in: *Journal of Public Economics*, vol. 127, p. 100-114.

**Henn, G., Frodermann, J., Jannott, D. (2009)**, “Handbuch des Aktienrechts”, C.F Müller Verlag, Heidelberg.

**Hirte, H. (2003)**, “Die Publizität der Organvergütungen zwischen Transparenz und Voyeurismus”, in: Abelthausen, T., Buck, P. (ed), Corporate Governance – Tagungsband der 1. Hannoveraner Unternehmensrechte, p. 75-93, Köln, Berlin, München.

**Hitz, J., Werner, J. (2012)**, “Why do Firms Resist Individual Disclosure of Management Remuneration?”, WP

**Hoffmann-Becking, M. (2005)**, “Rechtliche Anmerkungen zur Vorstands- und Aufsichtsratsvergütung”, in: Zeitschrift für das gesamte Handels- und Wirtschaftsrecht, Heft 02-03, p. 155-180.

**Hooghiemstra, R., Kuang, Y. F., Qin, B. (2015)**, “Say-on-Pay Votes: The Role of the Media”, in: European Accounting Review, Vol. 24 Issue 4, p753-778.

**Iacobucci, E. (1998)**, “The Effects of Disclosure on Executive Compensation”, in: University Of Toronto Law Journal, vol. 48(4), p. 489-520.

**Jensen. M. C., Meckling W. H (1979)**, “Rights and Production Functions: An Application to Labor-Managed Firms and Codetermination”, in: Journal of Business, 52. p. 469-506.

**Koenker, R. (2005)**, Quantile Regression. Cambridge University Press: New York.

**Koenker, R., Basset, G. (1978)**, “Regression Quantiles”, in: Econometrica, vol. 46(1), p. 33-50.

**Kramarz, F. and Thesmar, D. (2013)**, Social Networks in the Boardroom, Journal of the European Economic Association, vol. 11, 780-807.

**Kuhnen, M. C., Niessen, A. (2012)**, “Public Opinion and Executive Compensation”, in: Management Science, Vol. 58 Issue 7, p. 1249-1272.

**Lo, K. (2003)**, “Economic consequences of regulated changes in disclosure: the case of executive compensation”, in: Journal of Accounting and Economics, vol. 35, p. 285-314.

**Murphy, K. J. (2013)**, "Executive Compensation: Where we are, and how we got there," in: Handbook of the Economics of Finance, ed. G. Constantinides, M. Harris and R. Stulz, Elsevier Science North Holland.

**Murphy, K. J. (1996)**, “Reporting Choice and the 1992 Proxy Disclosure Rules”, in: Journal of Accounting, Auditing and Finance, vol. 11(3), p. 497-515.

- Oehmichen, J., Schult, A., Wolff, M. (2014)**, “Former Executives Serving as Non-Executive Directors: Resource Channels or Ineffective Monitors”, in: Schmalenbach Business Review, 66(4), p. 438-469.
- Perry, T., Zenner, M. (2001)**, “Pay for performance? Government regulation and the structure of compensation contracts”, in: Journal of Financial Economics, vol. 62(3), p. 453-488.
- Porter, S. R. (2015)**, “Quantile Regression: Analyzing Changes in Distributions Instead of Means”, in: Higher Education: Handbook of Theory and Research, ed. M. B. Paulsen, p. 335-381, Springer International Publishing Switzerland.
- Vesper-Gräske, M. (2013)**, “Say on Pay” in Germany: The Regulatory Framework and empirical Evidence”, in: German Law Journal, vol. 14(7), p. 749-795.
- Werder, A. V., Talaulicar, T., Kolat, G. L. (2005)**, “Compliance with the German Corporate Governance Code: an empirical analysis of the compliance statements by German listed companies”, in: Corporate Governance: An International Review, vol. 13(2), p. 178-187.
- Zeckhauser, R., Pound, J. (1990)**, “Are large shareholders effective monitors? An investigation of share ownership and corporate performance”, in: Asymmetric Information, Corporate Finance, and Investment, ed. R. Hubbard, p. 149-180, University of Chicago Press, Chicago.



