

Buchwald, Achim

Working Paper

Competition, outside directors and executive turnover: Implications for corporate governance in the EU

DICE Discussion Paper, No. 174

Provided in Cooperation with:

Düsseldorf Institute for Competition Economics (DICE), Heinrich Heine University Düsseldorf

Suggested Citation: Buchwald, Achim (2015) : Competition, outside directors and executive turnover: Implications for corporate governance in the EU, DICE Discussion Paper, No. 174, ISBN 978-3-86304-173-1, Heinrich Heine University Düsseldorf, Düsseldorf Institute for Competition Economics (DICE), Düsseldorf

This Version is available at:

<https://hdl.handle.net/10419/107068>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

DISCUSSION PAPER

No 174

Competition, Outside Directors and Executive Turnover: Implications for Corporate Governance in the EU

Achim Buchwald

February 2015

IMPRINT

DICE DISCUSSION PAPER

Published by

düsseldorf university press (dup) on behalf of
Heinrich-Heine-Universität Düsseldorf, Faculty of Economics,
Düsseldorf Institute for Competition Economics (DICE), Universitätsstraße 1,
40225 Düsseldorf, Germany
www.dice.hhu.de

Editor:

Prof. Dr. Hans-Theo Normann
Düsseldorf Institute for Competition Economics (DICE)
Phone: +49(0) 211-81-15125, e-mail: normann@dice.hhu.de

DICE DISCUSSION PAPER

All rights reserved. Düsseldorf, Germany, 2015

ISSN 2190-9938 (online) – ISBN 978-3-86304-173-1

The working papers published in the Series constitute work in progress circulated to stimulate discussion and critical comments. Views expressed represent exclusively the authors' own opinions and do not necessarily reflect those of the editor.

Competition, Outside Directors and Executive Turnover: Implications for Corporate Governance in the EU

Achim Buchwald^{a,b}

a) Monopolies Commission, Bonn, Germany

b) Düsseldorf Institute for Competition Economics, Düsseldorf, Germany

February 2015

Abstract

This study contributes to the ongoing debate on the relevance of non-executive outside directors for corporate governance building on a large panel of European listed firms in the period 2003 to 2011. Focusing on executive turnover as an indicator for effective monitoring, the findings reveal that outside directors and product market competition are substitutes. Outsiders increase the performance-turnover sensitivity of executives exclusively if competition in the industry is relatively weak. In an environment with effective competition, outsiders do not significantly influence the decision to replace underperforming managers. In fiercely competitive markets, the higher threat of bankruptcy or hostile takeover seems to effectively limit managerial discretion for opportunistic behavior.

JEL-Classification: G34, J24, J63, L40, M00

Keywords: Competition, Corporate Governance, Executive Turnover,
Outside Directors

Contact Details:

Achim Buchwald

Monopolies Commission

Heilsbachstraße 16, 53123 Bonn, Germany

phone: +49-228/338882-39, e-mail: achim.buchwald@monopolkommission.bund.de

1. Introduction

Initiatives aiming to improve the ongoing professionalization of boards with respect to its monitoring and advising competences and in particular the role of non-executive outside directors on the board are debated at national levels, as well as at a supranational level by the European Commission. The discussion is accompanied and supported by a wide and growing body of theoretical and empirical research in the field of corporate governance and management (Adams, Hermalin and Weisbach, 2010; Hermalin and Weisbach, 2003). Evaluating the effects of outsiders on the board the literature generally provides two diverging theoretical explanations. First, outsiders could mitigate the monitoring intensity. This may be due to a lack of firm-specific knowledge regarding internal processes, strategy or a firm's environment (e.g. Aghion, van Reenen, and Zingales, 2013). Further, outside supervisors may face conflicts of interests and as a consequence have incentives and the discretion for opportunistic behavior, arising for instance from individual utility maximization or mutually exclusive objectives of the sending and receiving firms (Conyon and Read, 2006; Fich and Shivdasani, 2006). Second, in contrary to the negative assessment of outsiders it is highlighted that outsiders are more independent and a scarce capable resource contributing to improve a firm's corporate governance (Masulis and Mobbs, 2011 or Fama and Jensen, 1983).

Empirical research has approached these questions with different emphases and methods. One strand of the literature has focused on executive turnover as an indicator for effective monitoring and governance. In this context, corresponding investigations analyze the relationship between certain board characteristics and board behavior, measured by the ability to replace underperforming managers (e.g. Fahlenbrach, Low, and Stulz, 2010; Fich and Shivdasani, 2006 or Hermalin and Weisbach, 2003).

The present study aims to contribute to extend the current state of research by taking into account the moderating role of product market competition on the expected relationship between outside directors on the board and executive turnover. As a second extension of the present literature the study refers to a supranational perspective using a large panel of listed firms in 15 European member states plus Norway and Switzerland. This cross-country perspective accounts for institutional and legal differences of board structures in different countries allowing us to derive broader and more generalizable implications.

In line with previous studies proportional hazard estimations show that outside directors on the board increase the risk of executive turnover what generally points to intensified monitoring. Further, outsiders significantly increase the performance-turnover sensitivity of executives. Accounting for competition intensity which was calculated on the basis of firm-specific Lerner indices we find that the positive relation between outsiders and monitoring is exclusively significant in the case of weak product market competition. We interpret this finding as evidence that effective competition substitutes for monitoring of outside directors. High competition in a market seems to effectively limit managerial discretion for opportunistic behavior, in so far as the pressure associated with competition forces managers to maximize firm value in the interests of shareholders. However, in situations of weak competition monitoring capacities of outside directors seem to be a crucial mechanism of corporate governance. The findings are robust to different measures of firm performance and competition. The results have also implications for competition policy. Since outside directors on the board increase executive fluctuation in particular if competition intensity is low, firm linkages via multiple directorships do not point to intensified collusion.

In the next section the theoretical considerations and previous related empirical results are discussed. Section 3 provides an overview on the institutional framework,

data sources and descriptive results. In section 4 the econometric set-up is introduced and main findings based on proportional hazard estimations are provided. The concluding section 5 discusses implications for business practice and policy-makers.

2. Theoretical Considerations and Previous Empirical Findings

During the last decades, various studies have examined the importance of certain board characteristics for firm behavior and outcomes. A recent comprehensive summary is provided by Adams, Hermalin and Weisbach (2010). Among other factors, research has focused on the role of board size (Yermack, 1996), staggered boards (Bebchuk and Cohen, 2005), CEO-chairman duality (Goyal and Park, 2002) or demographic factors, e.g. age, tenure or education (van der Walt and Ingley, 2003; Carpenter and Westphal, 2001; Hambrick and Fukutomi, 1991 or Hambrick and Mason, 1984), gender (Adams and Ferreira, 2009; Croson and Gneezy, 2009; Niederle and Vesterlund, 2007) or team diversity (Talke, Salomo, and Rost, 2010; Knight *et al.*, 1999; Hambrick, Cho, and Chen, 1996). Another distinct feature of board composition is the presence of non-executive outside directors in the boardroom. This empirical phenomenon has long been the subject of debate in the political discourse and is experiencing growing attention in economic research. In the literature conflicting approaches are brought forward to explain the relevance of outside directors for monitoring. It is argued that multiple directorships reflect the outstanding and scarce skills and experiences of top-managers in a concentrated labor market (Fama and Jensen, 1983). Since only a limited number of suitable candidates meet the high requirements, firms aim to co-opt these individuals to the board. Building on a principal-agent perspective, outside directors act as intermediates to align the interests of the incumbent management and shareholders. Typical agency problems refer to management remuneration and executive appointment

or replacement decisions (Hermalin and Weisbach, 2003, 1998). It is assumed that outsiders tend to be more independent monitors since they are usually full-time professionals in an executive position of another firm (Fahlenbrach, Low, and Stulz, 2010; Masulis and Mobbs, 2011; Hermalin, 2005). Regularly, income from their main activity exceeds compensation for additional outside positions by multiples. Directors use outside mandates primarily to increase their reputation or social status, establish new business contacts but also to extend their own ability and skills (Fich and White, 2005; Mace, 1986). Therefore both sending and receiving firms might benefit from the director interlock (Conyon and Read, 2006; Rosenstein and Wyatt, 1994). Further, outside directors increase the human capital in the boardroom if they provide certain expertise (Coles, Daniel, and Naveen, 2012; Uddin, 2012; Fich, 2005). This includes academic education (Carpenter and Westphal, 2001; Erhardt, Werbel, and Shrader, 2003; Kang, Cheng, and Gray, 2007) or professional background, for instance commercial banking (Booth and Deli, 1999), political connections (Faccio, 2006; Agrawal and Knoeber, 2001) or industry-specific experience (e.g. Kor and Sundaramurthy, 2009 or Balsmeier, Buchwald, and Stiebale, 2014 for a recent discussion).

Theoretical considerations could also derive negative aspects of multiple directorships if outsiders actually enhance agency problems of a firm. In particular, opportunistic behavior of outside directors could stem from conflicts of interests between supervisors and shareholders. Conyon and Read (2006) show that directors have incentives for exaggerated board seat accumulation to increase additional payments and to realize non-pecuniary benefits, e.g. influence, prestige or social status (Yermack, 2004 or Useem and Karabel, 1986). With an increasing number of simultaneous board mandates directors are prevented from conscientiously performing their duties in the respective firms resulting in an extenuated rate of control intensity

(Fich and Shivdasani, 2006; Perry and Peyer, 2005). Conflicts of interest might further arise from contradictory objectives of the director's home firm and the appointing firm. Dittmann, Maug and Schneider (2010) describe and empirically analyze typical conflicts in the case of bank representatives on the board of non-financial firms. Further, conflicts of interests are also relevant in the context of competition policy and in particular in the case of vertical relations. Establishing a personal connection with an up- or downstream firm, the sending firm gains influence on and access to confidential information of the target firm. It is possible that the sending firm tries to use this potential influence to maximize its own benefit at the cost of the appointing firm (see Buchwald, forthcoming for a discussion).

Other authors analyze social networks and disclose multiple directorships among officials with reciprocal relations (Cohen, Frazzini, and Malloy, 2008; Hwang and Kim, 2009). In conjunction with the finding that executives might be able to exercise influence on the appointment of new directors (Shivdasani and Yermack, 1999), outsiders on the board would thus even enhance managers' ability to escape from any efficient control (Fisman *et al.*, 2013). Finally, from a knowledge-based view one might also argue that outside directors lack sufficient information on firm-specific processes or strategy mitigating their ability to effectively supervise and evaluate executives' ability (Aghion, van Reenen, and Zingales, 2013; Balsmeier, Buchwald, and Stiebale, 2014).

The previous section has shown that theory allows opposing conclusions what illustrates the need for complementary empirical investigations. However, previous empirical findings do not reveal a uniform picture so far but often show that the assessment of the effects of outside directorships strongly depends on specific conditions. While a number of studies are interested in the relationship between outsiders and corporate financial performance (Masulis and Mobbs, 2011; Fahlenbrach,

Low, and Stulz, 2010; Jiraporn, Kim, and Davidson III, 2008; Perry and Peyer, 2005), other papers investigate their influence on board behavior. Ryan and Wiggins (2004) show that directors are more likely to receive equity-based compensation with an increasing fraction of outsiders pointing to more independent boards. In contrast, Core, Holthausen, and Larcker (1999) find that CEO compensation increases with the fraction of outside directors who simultaneously hold at least three board positions (“busy directors”). Similar, using different network measures, Barnea and Guedj (2009) show that firms with well-connected directors are characterized by higher CEO payments and lower CEO turnover-performance sensitivities and forced CEO departures. This is consistent with Fich and Shivdasani (2006) who report that firms with a majority of “busy directors” face lower turnover-performance sensitivities of CEOs indicating weaker governance. In general, executive turnover is a suitable indicator to assess monitoring abilities of the board because those events represent the potential to replace underperforming managers. Fahlenbrach, Low, and Stulz (2010) find no significant impact of the appointment of CEOs as outside directors on the turnover-performance sensitivity of the incumbent CEO. At the same time they are more likely to leave a board if they expect a decline in performance (Fahlenbrach, Low, and Stulz, 2013). Hermalin and Weisbach (2003) hypothesize that CEO turnover is more sensitive to performance when the board is more independent. This is supported by Weisbach (1988) who document higher sensitivity of turnover to performance in outsider dominated boards. Recent evidence for a sample of German firms also leads to a rather positive assessment of outside directors in terms of monitoring. Balsmeier, Buchwald and Dilger (forthcoming) find that outside directors who hold a parallel executive position significantly increase turnover of the executives they supervise. Further, they find that the relation depends on ownership concentration. Outside directors significantly increase executive turnover solely in situations of high free float. This

finding is interpreted as evidence that monitoring executed by shareholders and outside directors are substitutes. In addition, similar to Borokhovich, Parrino and Trapani (1996), Balsmeier, Buchwald and Zimmermann (2013) find that outside directors who simultaneously hold a management board position seem to facilitate the search for suitable external candidates in the case of (forced) CEO replacements and therefore contribute to improve the control intensity.

Within the scope of this investigation we consider the relevance of outside directors for board monitoring, measured by executive turnover, from a European perspective. Based on the theoretical predictions and previous empirical evidence we expect either a positive or negative influence on the monitoring intensity. Further, we are interested in the moderating effect of product market competition. One might argue that in environments with weak competition, the monitoring expertise of the board is particularly important to discipline the management. In situations of intense competition, executives should be disciplined by higher market pressure (Aghion, van Reenen, and Zingales, 2013; Karuna, 2007; Bertrand and Mullainathan, 2003; Hart and Oliver D., 1983). This may include an increased risk of bankruptcy or hostile takeover (Schmidt, 1997; Shleifer and Vishny, 1997). Supposing that outside directors enhance the efficiency of board monitoring we would expect that their influence is stronger in industries that are characterized by relative low competition. Another reasoning that is in line with the latter assumption refers to management quality. Van Reenen (2011) finds evidence that competition positively influences management quality which in turn increases productivity. This selection of more able managers in competitive environments should result in higher management quality with a lower probability of executive replacements and weaker need for monitoring by outsiders.

3. Institutional Framework and Data

Most previous studies in corporate governance research that deal with the makeup and effects of boards restricted their scope of analysis to single countries and in the vast majority to the US. To be able to get a more comprehensive picture of the functioning of boards the present study extended the analysis to listed firms in 15 different European member states plus Norway and Switzerland. A corresponding cross-country research design accounts for partially existing legal and institutional national differences upon firms highlighted by Kogut (2012) or Munari, Oriani and Sobrero (2010). Noteworthy differences include monistic board structures in Anglo-Saxon countries vs. dualistic or two-tiered boards in a number of continental European countries (Heidrick & Struggles, 2014, 2011). Further aspects concern the permission of personnel overlaps between executive or non-executive board positions, director interlocks between firms, restrictions of the number of simultaneous board mandates or the participation of employee representatives and certain gender quotas (e.g. Buchwald and Hottenrott, 2015; Balsmeier, Buchwald, and Peters, 2011; Gorton and Schmid, 2004 for an overview).

While these structural differences tend to limit the comparability of firms in single governance regimes, a progressing convergence process of governance systems is observable in Europe. This finds practical expression through an ongoing internationalization of multiple directorships and the implementation of directives and guidelines published by the European Commission. For instance, the European Commission (2011) prepared a Green Paper on corporate governance practices including recommendations for an effective composition of the board of directors. The council regulation on the statute for a European company allows firms to choose between a monistic or dualistic structure for its governing bodies (European Commission, 2001). In the empirical literature it is argued that board responsibilities are

similar in both two-tiered and Anglo-Saxon one-tiered boards (Fauver and Fuerst, 2006). In addition, Kaplan (1997) finds for a cross-country study that the punishment of underperforming managers is similar in different corporate governance systems.

Director-level data is used to model the relationship between outside directors and executive duration (for a detailed description of the data collection and compilation process see Buchwald, forthcoming; Monopolkommission, 2014). The initial data is obtained from Thomson Reuter's "Officers & Directors" database which includes information on executive and non-executive directors on the boards on an individual spell-level for nearly all European publicly listed firms in the period 2003 to 2011. This information is used to indicate tenure and failure events of executive directors. Further, we rely on this source to calculate the number and fraction of outside directors on the board. A non-executive director is classified as an outsider if he simultaneously holds at least one other board mandate within the sample firms. Additional financial and ownership data on the firm-level was obtained from the "ORBIS" database of Bureau van Dijk. Table I describes all variables that have been used in this study and refers to the corresponding sources.

(Table I: Variable definitions and data sources)

During the data cleansing process all subsidiaries which are majority owned by a global parent company were excluded. The assumption behind this approach is that subsidiaries' actions, like the decision to replace incumbent managers, are often presumably determined by the ultimate owner. Financial services providers were removed to provide appropriate comparability of financial information among the sample firms. After the final correction for missing values, the baseline panel includes 3,369 different European listed firms with a total of 18,369 executive directors and 61,254 associated person-year observations during the sample period. The distribution

of firms and executive directors by country is summarized in Table II.

(Table II: Pooled distribution by country)

Further, the number of executive director spells is with a value of 18,862 larger than the number of individual directors indicating a number of follow-up spells among the sample firms. In sum, we observe 6,665 failure events. Average executive tenure amounts to 4.5 years. Table I provides the pooled descriptive statistics. The corresponding correlation coefficients are shown in Table IV.

(Table III: Descriptive statistics)

(Table IV: Correlation coefficients)

In the empirical estimations we apply a set of variables to examine the influence of firm performance on executive turnover. At this we rely primarily on accounting-based measures of corporate performance like return on assets (*ROA*), return on equity (*ROE*) or return on capital employed (*ROCE*) which are identified to be more appropriate predictors of management turnover than stock price performance (Hermalin and Weisbach, 2003). However, in alternative regressions we also use *Tobin's Q* as an indicator for market-based performance.

Another widely used predictor of director turnover is the capital structure. It is argued that capital control is relatively weak in the absence of large blockholders increasing executives' discretion for opportunistic behavior (Balsmeier, Buchwald, and Dilger, forthcoming). To account for ownership dispersion, we use a dummy variable (*Block*) if one or more shareholders own a fraction of at least 25 % of the voting rights (Czarnitzki and Kraft, 2009). The ratio of debt to equity (*Debt Equity Ratio*) controls for firm leverage. Firm size is measured by the number of *Employees*. In line with the literature, we expect that the size of the board of directors might have an influence on

the monitoring intensity (Yermack, 1996). We distinguish between the number of executive directors (*No. Executives*) and the number of non-executive monitoring directors (*No. Non-Executives*).

We rely on the work of Aghion *et al.* (2005) and Nickell (1996) to calculate a widely accepted indicator for product market competition. The competition measure is based on the Lerner Indices, a price cost margin that was available for about 730.000 European firms (Monopolkommission, 2014). This information allows us to identify if competition in a certain industry on the NACE Rev. 2 three-digit numerical code level is higher or below the median on the country-level (*Dummy High Competition*) in a certain year.

The primary focus of interest of this study is to explore the relationship between outside directors and executive turnover. Therefore, to measure outside director representation on the board we use three different variables. These are the absolute number of outsiders (*No. Outside Directors*), a dummy that equals one if at least one outside director holds a mandate on the respective board (*Dummy Outside Directors*) and the number of outsiders in relation to the total number of non-executive board members (*Fraction Outside Directors*). Figure I graphically illustrates the development of the fraction of outside directors on the country-level during the years 2003 to 2011. On average across all countries, the presence of outsiders slightly decreased from 30.7 percent in 2003 to 27.1 percent in the year 2011.

(Figure I: Fraction of outside directors on the board during the period 2003 to 2011)

4. Empirical Results

4.1. Basic Model

We adopt semi-parametric Cox proportional hazard estimations to model the impact of different factors on the probability of executive failure events. Duration analyses are a suitable econometric approach to take account of the specific spell-structure of the data at hand. In particular, the Cox proportional hazard model is useful to handle right-censored data, meaning that an executive is still in office at the end of the observation period. Further, the model does not require assumptions concerning the distribution of the hazard function (see Wooldridge, 2010; Greene, 2003 or Kalbfleisch and Prentice, 2002). Because it is likely that firms differ in their corporate employment practice, we relaxed the assumption of identical baseline hazards by stratifying all model specifications on the firm-level. This approach controls for unobserved heterogeneity across firms but also across industries and countries (Balsmeier, Buchwald, and Dilger, forthcoming). The test for the proportional hazard assumption was conducted for each covariate and the global model and was insignificant for all model specifications (Hosmer, Lemeshow, and May, 2008).

Table V shows the results of Cox proportional hazard regressions of executive turnover. In the basic specification (a) we include the previously introduced firm- and board-specific variables. In specifications (b), (d) and (f) we control for the influence of the different covariates indicating outside director representation.

(Table V: Cox proportional hazard regressions of executive turnover)

Both higher firm performance, measured by return on assets and the competition intensity in the market have no significant influence on executive duration. If at least one shareholder owns a significant stake of a firm's equity, the risk of executive

turnover significantly decreases between 16 and 18 percent, depending on the respective specification. This finding is surprising at a first glance considering that managerial discretion is more pronounced in the absence of controlling shareholders (e.g. Balsmeier, Buchwald, and Dilger, forthcoming or Hart, 2001 for a discussion). However, the result is in line with Aghion, van Reenen, and Zingales (2013) who argue and find evidence that institutional owners protect CEOs from being fired after a short-term decline in profitability. Larger firms exhibit a significant lower risk of executive turnover. With respect to board size, we find contradictory results for the total number of executive and non-executive directors. With an increasing number of executive board members, the risk of turnover increases for each member. Concurrently, a higher number of monitoring non-executives is associated with longer tenure of the management. This finding points to efficient monitoring of smaller boards (Yermack, 1996).

Table V further indicates that all variables representing outside directors on the board increase the likelihood of executive turnover. For instance, if at least one outside director holds a non-executive mandate, the risk of executive turnover increases by more than 50 percent. Specification (d) reveals that every additional outside director increases the hazard rate of executives by 17 percent. To further investigate the influence of outside directors on the monitoring intensity, specifications (c), (e) and (g) interact return on assets with the respective indicators. The coefficients on the interaction term are negative and significant indicating that executives on boards that are monitored by outside directors are less likely to leave the firm if financial performance is higher and vice versa.

4.2. Executive Turnover and Product Market Competition

The previous results have shown that executive replacements are more sensitive to

financial performance if the board is supervised by outside directors. In this section, we further analyze the role of outside directors for corporate governance and test whether the influence of outside directors on the performance-turnover sensitivity is conditional on the intensity of product market competition. To address this question, we follow the approach of Aghion, van Reenen and Zingales (2013) and split the sample by whether competition in the firms' focal market is above or below the national industry average in a current year. In columns (a) and (b) Table VI reports the results from hazard estimations for the full sample and in columns (c) and (d) results for the subsample of firms in industries with high competition. Specifications (e) and (f) repeat the estimations for the subsample of observations with low competition.

For each sample, we use two different performance indicators to measure the performance-turnover sensitivity: continuous return on assets and a dummy that equals one if a firm's return on assets is below the annual industry average. Because all outside director indicator variables yielded similar results, the following analyses are based on the fraction of outside directors on the board.

(Table VI: Cox proportional hazard regressions accounting for product market competition)

Table VI shows that a higher fraction of outside directors significantly increases executive fluctuation in all specifications. Further, results for the full sample reveal that a higher proportion of outside directors influence the performance-turnover sensitivity. First, executive turnover is less frequently with higher return on assets and second, executives are more likely to be replaced in the case of below-average returns.

However, the comparison between the subsamples for high and low competition illustrates that the finding is driven by firms in environments with low competition. These results support the assumption that monitoring executed by outside directors is

particularly valuable in the absence of effective competition. Conversely, fierce competition associated with a higher pressure to maximize profits seems to act as an alternative mechanism of executive control.

4.3. Further Robustness Checks

As an additional robustness check Table VII repeats the previous subsample estimations using different performance measures. Supplementary to return on assets we tested the below-average dummies for return on equity, return on capital employed and Tobin's Q to measure stock price performance. The isolated effect of the respective variables is positive and significant for the observations with high competition reflecting that executive replacement decisions seem to be related to financial performance for these firms. In the subsample for low competition we find only weak evidence in the case of return on equity. Interestingly, below-average market performance has no significant effect in the case of high competition and even a negative and significant effect in industries with low competition. This finding appears to be puzzling given that lower stock price performance increases executive duration pointing to a lower market value orientation if product market competition is rather low. Further, in neither subsample the proportion of outside supervisors is significantly related to executive turnover in the Tobin's Q regressions (c) and (f). With regard to the interaction terms it appears again that the influence of outside monitors on the performance-turnover sensitivities is positive and highly significant exclusively in the subsample with weak competition. For the Tobin's Q regression (c) we derive a weakly positively significant coefficient and the magnitude of this effect is larger in the estimation for industries with a lower level of competition (f). While executive turnover is negatively related to lower market performance in the latter specification, outside directors actually seem to consider market-based performance in the context of their

monitoring activities. In sum, the findings support the hypothesis that outside directors contribute to increase the monitoring intensity in the boardroom if managers are insufficiently disciplined by effective product market competition.

(Table VII: Cox proportional hazard regressions controlling for alternative performance measures)

Finally, we tested whether the results are robust to alternative measures of competition. Table VIII shows the results for the observations with weak and strong competition using four- and more aggregated two-digit NACE industry codes to calculate the median of the Lerner index. Additionally, specifications (c) and (f) include a time-invariant measure on the three-digit level as introduced by Aghion, van Reenen and Zingales (2013). The estimations yielded similar results in all specifications. While outside directors increase executive duration, the interaction term remains positive and significant only if competition intensity is low.

(Table VIII: Cox proportional hazard regressions controlling for different measures of product market competition)

5. Discussion

This paper aims to contribute to the current debate on efficient board composition by empirically analyzing the influence of non-executive outside directors on the board of a large sample of European firms on managerial turnover. In addition to previous studies that have mainly focused on specific characteristics of outsiders, for example experiences and knowledge, time constraints or conflicts of interest, this paper addresses the moderating effect of product market competition in the relationship between outside directors and the sensitivity of turnover to corporate financial

performance. The rationale is that the principal-agent conflict between shareholders and management is intensified in environments of weak product market competition that encourage opportunistic behavior. In such an environment, independent outside monitoring directors should be of particular importance for a firm's corporate governance. In fiercely competitive markets, the higher threat of bankruptcy or hostile takeover sets incentives for managers to behave in the interest of shareholders.

The empirical results clearly suggest that outside directors and product market competition are substitutes. We find that the presence of outside directors on the board increases the risk of executive turnover. However, the influence of outsiders on the performance-turnover sensitivity of executives is positive and significant if competition in the industry is relatively low. For observations in markets with high competition, the interaction is insignificant. In addition, we do not find that competition has an impact on executive fluctuation. This finding points to a selection of better managerial talent in competitive markets or simultaneously greater managerial entrenchment in industries with lower competition.

Indeed, it could be argued that the availability of outside expertise should be particularly valuable when competition is high. This argumentation does not necessarily conflict with the previous explanation, given that in respective environments the main benefits of outsiders arise from their advising role to support the appointing firm in gaining and maintaining competitive advantages rather than from their function as independent supervisors.

The paper supplements recent publications that formulate recommendations concerning diversity of non-executive directors' profiles e.g. professional and international experience, independence and availability (European Commission, 2011) by shifting emphasis towards external factors that have obviously practical implications for corporate governance.

Assessing the results from the point of view of competition policy, the development of inter-firm relationships via multiple directorships does not point to intensified collusion. It is argued that personal interlocks may facilitate informal coordination or illegal agreements between competitors or in the case of vertical relations (Buchwald, forthcoming; Mizruchi, 1996). If this is true, one would expect – if at all – a decrease in executive fluctuation. Indeed, the issue of outside directorships is also relevant in the context of the current consultation on merger control by the European Commission (2013). In this context it might be possible that director linkages are a mechanism to exert influence on a target firm. Therefore, our findings could also reflect that firms use the potential to exert influence via outside directorships to replace incumbent managers by preferred loyal candidates.

Figures and Tables

Table I: Variable definitions and data sources

<i>Variable</i>	<i>Description</i>	<i>Source</i>
<i>Firm Characteristics</i>		
Return on Assets	$(\text{Profit (Loss) for period} / \text{Shareholders Funds}) * 100$	Bureau van Dijk
ROA low	Dummy indicating whether firm performance is below the average industry-adjusted ROA	Bureau van Dijk
Return on Equity	$(\text{Profit (Loss) for period} / \text{Total Assets}) * 100$	Bureau van Dijk
ROE low	Dummy indicating whether firm performance is below the average industry-adjusted ROE	Bureau van Dijk
Return on Capital Employed	$(\text{Profit (Loss) for period} + \text{Interest Paid}) / (\text{Shareholders Funds} + \text{NonCurrent Liabilities}) * 100$	Bureau van Dijk
ROCE low	Dummy indicating whether firm performance is below the average industry-adjusted ROCE	Bureau van Dijk
Tobin's Q	$(\text{Market value} + \text{Total Assets} - \text{Shareholders Funds}) / \text{Total Assets}$	Bureau van Dijk
Tobin's Q low	Dummy indicating whether firm performance is below the average industry-adjusted Tobin's Q	Bureau van Dijk
Dummy High Competition	Dummy indicating whether industry-specific competition intensity is above the median for each country	Bureau van Dijk
Block	Dummy variable that equals 1 if the largest shareholder owns at least 25 % of the capital stock	Bureau van Dijk
Debt Equity Ratio	$(\text{Total Assets} - \text{Shareholders Funds}) / \text{Shareholders Funds}$	Bureau van Dijk
Employees	Number of employees	Bureau van Dijk
No. Executives	Number of executives directors on the board	ThomsonReuters
No. Non-Executives	Number of non-executives directors on the board	ThomsonReuters
Dummy Outside Directors	Dummy indicating if at least one outside director holds a non-executive position on the board	ThomsonReuters
No. Outside Directors	Number of outside non-executive directors	ThomsonReuters
Fraction Outside Directors	Proportion of outside non-executive directors	ThomsonReuters
<i>Individual Characteristics</i>		
Tenure	Executives' tenure in office in years	ThomsonReuters
Failure	Dummy indicating if an executive director leaves the board	ThomsonReuters

Notes: Bureau van Dijk: "ORBIS" database. ThomsonReuters: "Officers & Directors" database.

Table II: Pooled distribution by country

<i>Country (Iso-Code)</i>	<i>No. Firms</i>	<i>Firm-year level</i>		<i>Director-year level</i>	
		<i>No. Observations</i>	<i>Fraction</i>	<i>No. Observations</i>	<i>Fraction</i>
Austria (AT)	48	236	1.4	679	1.1
Belgium (BE)	80	345	2.0	1,261	2.1
Switzerland (CH)	110	730	4.3	4,378	7.1
Germany (DE)	456	2,193	13.0	6,133	10.0
Denmark (DK)	71	358	2.1	1,102	1.8
Spain (ES)	101	483	2.9	1,049	1.7
Finland (FI)	93	682	4.0	4,344	7.1
France (FR)	412	2,025	12.0	7,912	12.9
United Kingdom (UK)	1,115	5,630	33.3	17,828	29.1
Greece (GR)	165	750	4.4	3,279	5.4
Ireland (IE)	51	252	1.5	1,193	1.9
Italy (IT)	122	434	2.6	1,322	2.2
Luxembourg (LU)	14	49	0.3	213	0.3
Netherlands (NL)	114	636	3.8	2,427	4.0
Norway (NO)	117	555	3.3	2,358	3.8
Portugal (PT)	21	70	0.4	211	0.3
Sweden (SE)	286	1,487	8.8	5,565	9.1
Total	3,376	16,915	100.0	61,254	100.0

Table III: Descriptive statistics

<i>Variable</i>	<i>Obs.</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
<i>Firm Characteristics (No. Firms: 3,376)</i>					
Return on Assets	16,915	1.27	11.40	-61.52	26.89
ROA low	16,915	0.31	-	0	1
Return on Equity	16,915	2.36	28.69	-206.99	78.75
ROE low	16,915	0.27	-	0	1
Return on Capital Employed	16,915	4.52	17.57	-104.01	49.43
ROCE low	16,915	0.26	-	0	1
Tobin's Q	11,428	1.49	1.78	0.11	128.79
Tobin's Q low	11,428	0.76	0.43	0	1
Dummy High Competition	16,915	0.48	-	0	1
Block	16,915	0.35	-	0	1
Debt Equity Ratio	16,915	2	2	0	15
Employees	16,915	10,066.82	37,679.51	1	639,904
No. Executives	16,915	6.45	4.45	1	29
No. Non-Executives	16,915	5.84	3.64	1	33
Dummy Outside Directors	16,915	0.67	-	0	1
No. Outside Directors	16,915	1.64	1.83	0	14
Fraction Outside Directors	16,915	26.73	25.57	0.00	100.00
<i>Individual Characteristics (No. Individuals: 18,369)</i>					
Tenure	61,254	4.46	3.94	1	44
Failure	61,254	0.11	-	0	1

Table IV: Correlation coefficients

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) Return on Assets	1.00																		
(2) ROA low	-0.66	1.00																	
(3) Return on Equity	0.86	-0.64	1.00																
(4) ROE low	-0.64	0.81	-0.64	1.00															
(5) Return on Capital Employed	0.94	-0.64	0.88	-0.63	1.00														
(6) ROCE low	-0.64	0.78	-0.61	0.80	-0.65	1.00													
(7) Tobin's Q	0.09	-0.07	0.08	-0.05	0.08	-0.05	1.00												
(8) Tobin's Q low	-0.22	0.16	-0.22	0.12	-0.21	0.13	-0.37	1.00											
(9) Dummy High Competition	-0.04	0.09	-0.04	0.10	-0.04	0.11	-0.07	0.02	1.00										
(10) Block	0.00	0.02	-0.02	0.03	0.00	0.01	-0.05	0.06	0.00	1.00									
(11) Debt Equity Ratio	-0.08	0.13	-0.13	0.09	-0.01	0.03	-0.08	0.12	0.07	0.07	1.00								
(12) Employees	0.07	-0.10	0.11	-0.11	0.08	-0.10	-0.03	0.05	0.05	-0.05	0.17	1.00							
(13) No. Executives	0.12	-0.10	0.12	-0.10	0.12	-0.11	0.01	-0.03	-0.04	0.03	0.06	0.26	1.00						
(14) No. Non-Executives	0.10	-0.11	0.13	-0.11	0.10	-0.11	-0.03	0.03	0.03	0.03	0.15	0.46	0.30	1.00					
(15) Dummy Outside Directors	0.08	-0.09	0.11	-0.08	0.09	-0.09	0.04	-0.08	0.03	-0.10	0.04	0.18	0.18	0.34	1.00				
(16) No. Outside Directors	0.11	-0.13	0.15	-0.13	0.12	-0.14	0.00	-0.03	0.02	-0.08	0.12	0.49	0.34	0.62	0.59	1.00			
(17) Fraction Outside Directors	0.08	-0.09	0.11	-0.08	0.09	-0.10	0.03	-0.08	0.02	-0.15	0.04	0.19	0.18	0.11	0.71	0.73	1.00		
(18) Tenure	0.09	-0.08	0.08	-0.08	0.08	-0.06	0.02	-0.04	0.01	0.01	-0.04	-0.03	-0.04	-0.04	-0.05	-0.06	-0.06	1.00	
(19) Failure	-0.05	0.06	-0.04	0.06	-0.04	0.05	0.00	0.02	0.00	-0.02	0.01	0.01	0.03	0.02	0.04	0.03	0.04	-0.03	1.00

Notes: The table presents the correlation coefficients between the variables used in the study (n=61,254).

Table V: Cox proportional hazard regressions of executive turnover

	<i>Model</i>						
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
Return on Assets	-0.000 (-0.05)	-0.000 (-0.20)	0.005 (1.48)	-0.001 (-0.44)	0.004 (1.46)	-0.001 (-0.41)	0.004 (1.44)
Dummy HighCompetition	0.003 (0.06)	-0.004 (-0.08)	-0.009 (-0.19)	-0.003 (-0.06)	-0.004 (-0.08)	0.001 (0.02)	-0.001 (-0.02)
Block	-0.194*** (-3.10)	-0.195*** (-3.08)	-0.198*** (-3.14)	-0.178*** (-2.84)	-0.182*** (-2.89)	-0.179*** (-2.86)	-0.182*** (-2.91)
Debt Equity Ratio	-0.032* (-1.82)	-0.031* (-1.77)	-0.030* (-1.72)	-0.032* (-1.76)	-0.031* (-1.74)	-0.032* (-1.77)	-0.030* (-1.68)
Log Employees	-0.370*** (-5.49)	-0.358*** (-5.28)	-0.358*** (-5.27)	-0.380*** (-5.56)	-0.383*** (-5.58)	-0.369*** (-5.43)	-0.370*** (-5.42)
No. Executives	0.257*** (24.24)	0.257*** (24.31)	0.257*** (24.28)	0.253*** (23.97)	0.253*** (23.92)	0.254*** (24.02)	0.254*** (24.00)
No. Non-Executives	-0.041** (-2.28)	-0.053*** (-2.85)	-0.053*** (-2.85)	-0.083*** (-4.22)	-0.084*** (-4.26)	-0.034* (-1.86)	-0.034* (-1.89)
Dummy Outside Directors		0.431*** (6.67)	0.426*** (6.58)				
ROA x Dummy Outsiders			-0.008* (-1.92)				
No. Outside Directors				0.157*** (7.78)	0.165*** (8.06)		
ROA x No. Outsiders					-0.003*** (-2.74)		
Fraction Outside Directors						0.009*** (7.74)	0.009*** (7.73)
ROA x Fraction Outsiders							-0.000** (-2.49)
No. Spells	18,862	18,862	18,862	18,862	18,862	18,862	18,862
No. Failures	6,665	6,665	6,665	6,665	6,665	6,665	6,665
No. Observations	61,254	61,254	61,254	61,254	61,254	61,254	61,254
Pseudo R ²	0.048	0.050	0.050	0.051	0.052	0.051	0.051
Log Likelihood	-9,653	-9634.824	-9,633	-9624.024	-9,621	-9627.870	-9,625
Akaike Information Criterion (AIC)	19,319.33	19,285.65	19,284.74	19,264.05	19,260.40	19,271.74	19,268.93
Stratified (firm-level)	yes	yes	yes	yes	yes	yes	yes
Global Test of PH Assumption (χ^2)	6.32	6.71	6.64	6.82	7.24	6.33	6.72

Notes: The table reports estimations of executive turnover likelihoods using Cox proportional hazard models. The dependent variable is the hazard rate. Positive coefficients imply an increase of the hazard rate and thus a higher risk of turnover while negative coefficients imply a longer expected tenure of the executives in the sample. Z-statistics (in parentheses) are calculated using heteroskedasticity-robust standard errors that allow for autocorrelation at the firm-level. All estimations stratified on the firm-level to control for unobserved heterogeneity across firms. *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Table VI: Cox proportional hazard regressions accounting for product market competition

	<i>Model</i>					
	<i>Full Sample</i>		<i>High Competition</i>		<i>Low Competition</i>	
	(a)	(b)	(c)	(d)	(e)	(f)
Return on Assets	0.004 (1.44)		0.001 (0.27)		0.009** (2.20)	
ROA low		0.100 (1.53)		0.203** (2.04)		-0.166* (-1.66)
Dummy High Competition	-0.001 (-0.02)	-0.012 (-0.25)				
Block	-0.182*** (-2.91)	-0.182*** (-2.89)	-0.375*** (-3.72)	-0.367*** (-3.64)	-0.219** (-2.23)	-0.217** (-2.22)
Debt Equity Ratio	-0.030* (-1.68)	-0.042** (-2.36)	-0.031 (-1.15)	-0.050* (-1.81)	-0.016 (-0.54)	-0.023 (-0.77)
Log Employees	-0.370*** (-5.42)	-0.381*** (-5.56)	-0.226*** (-2.94)	-0.252*** (-3.33)	-0.476*** (-3.30)	-0.468*** (-3.25)
No. Executives	0.254*** (24.00)	0.252*** (23.88)	0.222*** (11.86)	0.219*** (11.69)	0.263*** (17.96)	0.266*** (18.08)
No. Non-Executives	-0.034* (-1.89)	-0.034* (-1.89)	-0.106*** (-4.15)	-0.103*** (-4.06)	0.031 (1.18)	0.028 (1.07)
Fraction Outside Directors	0.009*** (7.73)	0.008*** (5.87)	0.008*** (4.57)	0.007*** (3.69)	0.009*** (4.76)	0.006*** (2.89)
ROA x Fraction Outsiders	-0.000** (-2.49)		-0.000 (-0.36)		-0.000*** (-3.28)	
ROA low x Fraction Outsiders		0.004** (2.57)		0.003 (1.07)		0.010*** (4.08)
No. Spells	18,862	18,862	9,058	9,058	9,804	9,804
No. Failures	6,665	6,665	3,156	3,156	3,509	3,509
No. Observations	61,254	61,254	29,229	29,229	32,025	32,025
Pseudo R ²	0.051	0.052	0.044	0.046	0.053	0.054
Log Likelihood	-9,625	-9,614	-3,753	-3,745	-4,355	-4,351
Akaike Information Criterion (AIC)	19,268.93	19,245.06	7,522.44	7,505.71	8,726.61	8,718.77
Stratified (firm-level)	yes	yes	yes	yes	yes	yes
Global Test of PH Assumption (χ^2)	6.72	6.33	2.52	2.38	11.16	12.02

Notes: The table reports estimations of executive turnover likelihoods using Cox proportional hazard models. The dependent variable is the hazard rate. Positive coefficients imply an increase of the hazard rate and thus a higher risk of turnover while negative coefficients imply a longer expected tenure of the executives in the sample. Z-statistics (in parentheses) are calculated using heteroskedasticity-robust standard errors that allow for autocorrelation at the firm-level. All estimations stratified on the firm-level to control for unobserved heterogeneity across firms. *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Table VII: Cox proportional hazard regressions controlling for alternative performance measures

	<i>Model</i>					
	<i>High Competition</i>			<i>Low Competition</i>		
	(a)	(b)	(c)	(d)	(e)	(f)
ROE low	0.251** (2.50)			0.176* (1.68)		
ROCE low		0.317*** (3.20)			-0.147 (-1.33)	
Tobin's Q low			-0.211 (-1.29)			-0.695*** (-4.26)
Block	-0.350*** (-3.43)	-0.374*** (-3.68)	-0.306** (-2.56)	-0.223** (-2.28)	-0.218** (-2.23)	-0.129 (-1.00)
Debt Equity Ratio	-0.049* (-1.77)	-0.053** (-1.97)	-0.078** (-2.04)	-0.042 (-1.41)	-0.019 (-0.62)	-0.043 (-1.29)
Log Employees	-0.246*** (-3.33)	-0.252*** (-3.46)	-0.104 (-1.05)	-0.481*** (-3.32)	-0.475*** (-3.29)	-0.089 (-0.55)
No. Executives	0.222*** (11.86)	0.217*** (11.64)	0.201*** (8.08)	0.264*** (18.01)	0.265*** (18.02)	0.275*** (14.11)
No. Non-Executives	-0.103*** (-4.06)	-0.097*** (-3.79)	-0.118*** (-3.66)	0.023 (0.88)	0.028 (1.06)	0.017 (0.51)
Fraction Outside Directors	0.008*** (4.26)	0.008*** (3.87)	0.004 (1.09)	0.007*** (3.77)	0.007*** (3.49)	0.005 (1.46)
ROE low x Fraction Outsiders	0.001 (0.22)			0.006** (2.48)		
ROCE low x Fraction Outsiders		0.003 (1.20)			0.008*** (3.10)	
Tobin's Q low x Fraction Outsiders			0.006* (1.69)			0.008*** (2.61)
No. Spells	9,058	9,058	6,975	9,804	9,804	7,619
No. Failures	3,156	3,156	2,275	3,509	3,509	2,472
No. Observations	29,229	29,229	24,479	32,025	32,025	26,978
Pseudo R ²	0.046	0.048	0.035	0.055	0.053	0.050
Log Likelihood	-3,747	-3,738	-2,743	-4,347	-4,355	-3,035
Akaike Information Criterion (AIC)	7,509	7,493	5,501	8,709	8,726	6,086
Stratified (firm-level)	yes	yes	yes	yes	yes	yes
Global Test of PH Assumption (χ^2)	2.59	2.74	3.07	11.49	12.10	12.40

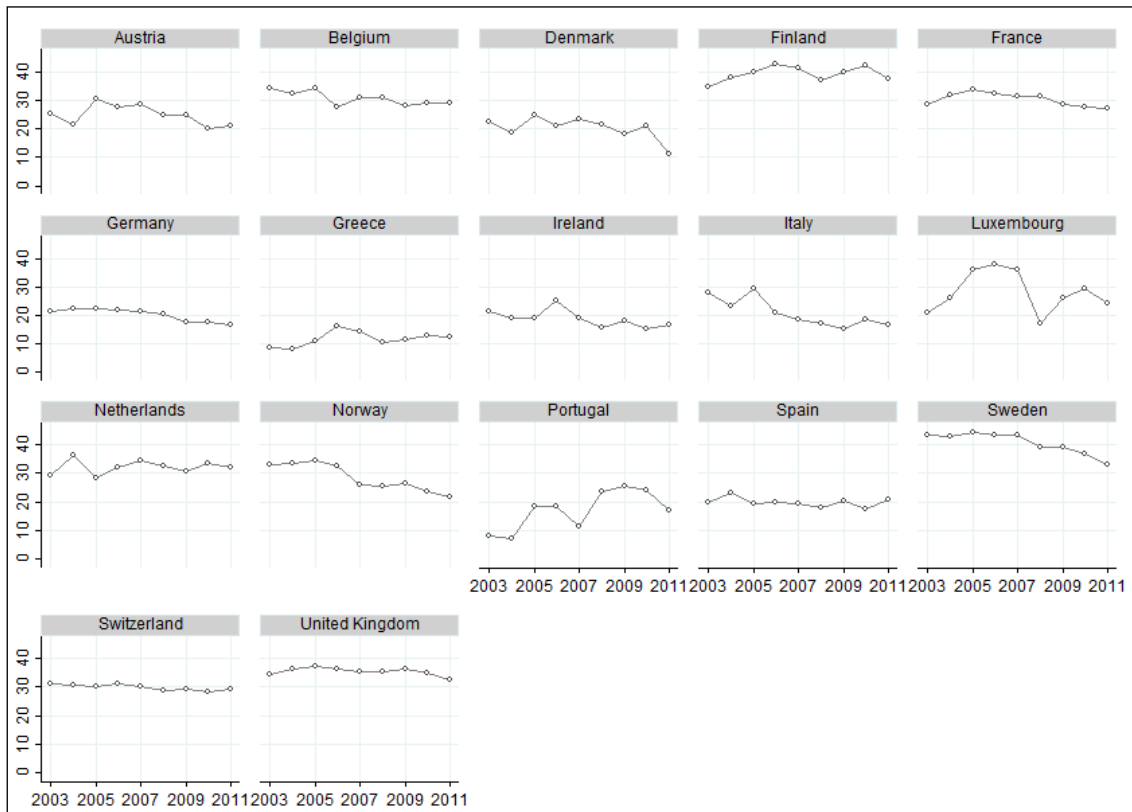
Notes: The table reports estimations of executive turnover likelihoods using Cox proportional hazard models. The dependent variable is the hazard rate. Positive coefficients imply an increase of the hazard rate and thus a higher risk of turnover while negative coefficients imply a longer expected tenure of the executives in the sample. Z-statistics (in parentheses) are calculated using heteroskedasticity-robust standard errors that allow for autocorrelation at the firm-level. All estimations stratified on the firm-level to control for unobserved heterogeneity across firms. *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Table VIII: Cox proportional hazard regressions controlling for different measures of product market competition

	<i>Model</i>					
	<i>High Competition</i>			<i>Low Competition</i>		
	(a)	(b)	(c)	(d)	(e)	(f)
<i>Measure of competition</i>	<i>varies</i>	<i>varies over time</i>	<i>constant</i>	<i>varies</i>	<i>varies over time</i>	<i>constant</i>
<i>Industry Classification</i>	<i>NACE Rev. 2</i>					
	<i>2-digit</i>	<i>4-digit</i>	<i>3-digit</i>	<i>2-digit</i>	<i>4-digit</i>	<i>3-digit</i>
ROA low	0.444*** (4.38)	0.298*** (2.99)	0.296*** (3.06)	-0.277*** (-2.70)	-0.145 (-1.32)	-0.116 (-1.30)
Block	-0.343*** (-3.52)	-0.337*** (-3.39)	-0.068 (-0.77)	-0.161 (-1.60)	-0.158 (-1.53)	-0.308*** (-3.45)
Debt Equity Ratio	-0.018 (-0.75)	-0.070** (-2.49)	-0.050** (-2.04)	-0.007 (-0.24)	-0.003 (-0.09)	-0.025 (-0.89)
Log Employees	-0.244*** (-3.14)	-0.316*** (-3.88)	-0.177*** (-2.85)	-0.640*** (-6.47)	-0.481*** (-2.96)	-0.599*** (-4.77)
No. Executives	0.228*** (11.49)	0.215*** (12.02)	0.234*** (14.06)	0.278*** (18.71)	0.270*** (17.77)	0.264*** (19.94)
No. Non-Executives	-0.030 (-1.01)	-0.078*** (-3.19)	-0.093*** (-3.92)	0.052** (2.42)	0.039 (1.46)	0.009 (0.35)
Fraction Outside Directors	0.013*** (6.23)	0.010*** (4.91)	0.010*** (5.21)	0.006*** (3.38)	0.005** (2.21)	0.006*** (3.10)
ROA low x Fraction Outsiders	-0.002 (-0.88)	0.001 (0.52)	0.001 (0.51)	0.010*** (4.24)	0.010*** (3.96)	0.007*** (3.03)
No. Spells	8,996	8,950	9,046	10,141	9,674	9,822
No. Failures	3,152	3,179	3,192	3,633	3,377	3,479
No. Observations	29,321	28,496	29,222	32,920	31,671	32,041
Pseudo R ²	0.048	0.049	0.051	0.060	0.054	0.055
Log Likelihood	-3,810	-3,711	-4,417	-4,638	-4,123	-5,072
Akaike Information Criterion (AIC)	7,636	7,438	8,850	9,293	8,262	10,160
Stratified (firm-level)	yes	yes	yes	yes	yes	yes
Global Test of PH Assumption (χ^2)	5.80	3.38	3.47	8.50	8.16	12.70

Notes: The table reports estimations of executive turnover likelihoods using Cox proportional hazard models. The dependent variable is the hazard rate. Positive coefficients imply an increase of the hazard rate and thus a higher risk of turnover while negative coefficients imply a longer expected tenure of the executives in the sample. Z-statistics (in parentheses) are calculated using heteroskedasticity-robust standard errors that allow for autocorrelation at the firm-level. All estimations stratified on the firm-level to control for unobserved heterogeneity across firms. *, **, *** denote significance at the 10%, 5% and 1% levels, respectively.

Figure I: Average proportion of non-executive outside directors on the board by country in the period 2003 to 2011



References

- Adams RB, Hermalin BE, Weisbach MS. 2010. The Role of Boards of Directors in Corporate Governance: A Conceptual Framework & Survey. *Journal of Economic Literature* 48(1) 2010: 58–107.
- Adams RB, Ferreira D. 2009. Women in the Boardroom and Their Impact on Governance and Performance. *Journal of Financial Economics* 94: 291–309.
- Aghion P, van Reenen JM, Zingales L. 2013. Innovation and Institutional Ownership. *American Economic Review* 103(1): 277–304.
- Aghion P, Bloom N, Blundell R, Griffith R, Howitt P. 2005. Competition and Innovation: an Inverted-U Relationship. *The Quarterly Journal of Economics* 120(2): 701–728.
- Agrawal A, Knoeber CR. 2001. Do Some Outside Directors Play a Political Role? *Journal of Law and Economics* 44(1): 179–198.
- Balsmeier B, Buchwald A, Peters H. 2011. Outside Board Memberships of CEOs: Expertise or Entrenchment? DICE Discussion Paper No. 26.
- Balsmeier B, Buchwald A, Zimmermann S. 2013. The Influence of Top Management Corporate Networks on CEO Succession. *Review of Managerial Science* 7(3): 191–221.
- Balsmeier B, Buchwald A, Stiebale J. 2014. Outside Directors on the Board and Innovative Firm Performance. *Research Policy* 43(10): 1800–1815.
- Balsmeier B, Buchwald A, Dilger A. Executive Turnover and Outside Directors on Two-Tiered Boards. *Managerial and Decision Economics* forthcoming.
- Barnea A, Guedj I. 2009. Director Networks. EFA 2007 Ljubljana Meetings Paper.
- Bebchuk LA, Cohen A. 2005. The Costs of Entrenched Boards. *Journal of Financial Economics* 78(2): 409–433.
- Bertrand M, Mullainathan S. 2003. Enjoying the Quiet Life? Corporate Governance and Managerial Preferences. *Journal of Political Economy* 111: 1043–1075.
- Booth JR, Deli DN. 1999. On Executives of Financial Institutions as Outside Directors. *Journal of Corporate Finance* 5(3): 227–250.
- Borokhovich KA, Parrino RP, Trapani T. 1996. Outside Directors and CEO Selection. *Journal of Financial and Quantitative Analysis* 31: 337–355.
- Buchwald A. European Firm Networks and Competition Theoretical Background and Empirical Evidence. *International Journal of Networking and Virtual Organisations* forthcoming.
- Buchwald A, Hottenrott H. 2015. Women on the Board and Executive Duration – Evidence for European Listed Firms. Unpublished.

- Carpenter MA, Westphal JD. 2001. The Strategic Context of External Network Ties: Examining the Impact of Director Appointments on Board Involvement in Strategic Decision Making. *Academy of Management Journal* 44(4): 639–660.
- Cohen L, Frazzini A, Malloy C. 2008. The Small World of Investing: Board Connections and Mutual Fund Returns. *Journal of Political Economy* 116(5): 951–979.
- Coles JL, Daniel ND, Naveen L. 2012. Board Advising. SSRN Working Paper.
- Canyon MJ, Read LE. 2006. A Model of the Supply of Executives for Outside Directorships. *Journal of Corporate Finance* 12(3): 645–659.
- Core JE, Holthausen RW, Larcker DF. 1999. Corporate Governance, Chief Executive Officer Compensation, and Firm Performance. *Journal of Financial Economics* 51(3): 371–406.
- Crosen R, Gneezy U. 2009. Gender Differences in Preferences. *Journal of Economic Literature* 47(2) 2009: 448–74.
- Czarnitzki D, Kraft K. 2009. Capital Control, Debt Financing and Innovative Activity. *Journal of Economic Behavior & Organization* 71(2): 372–383.
- Dittmann I, Maug E, Schneider C. 2010. Bankers on the Boards of German Firms: What They Do, What They are Worth, and Why They are (Still) There. *Review of Finance* 14(1): 35–71.
- Erhardt NL, Werbel JD, Shrader CB. 2003. Board of Director Diversity and Firm Financial Performance. *Corporate Governance: An International Review* 11(2): 102–111.
- European Commission. 2001. Council Regulation on the Statute for a European Company (SE). Council Regulation (EC) No 2157/2001.
- European Commission. 2011. Green Paper: The EU Corporate Governance Framework. COM(2011) 164 final.
- European Commission. 2013. Towards More Effective EU Merger Control. Commission Staff Working Document, SWD(2013) 239 final.
- Faccio M. 2006. Politically Connected Firms. *American Economic Review* 96(1): 369–386.
- Fahlenbrach R, Low A, Stulz RM. 2013. The Dark Side of Outside Directors: Do They Quit Ahead of Trouble? Dice Center WP 2010-7.
- Fahlenbrach R, Low A, Stulz RM. 2010. Why Do Firms Appoint CEOs as Outside Directors? *Journal of Financial Economics* 97(1): 12–32.
- Fama EF, Jensen MC. 1983. Separation of Ownership and Control. *Journal of Law and Economics* 26(2): 301–325.
- Fauver L, Fuerst ME. 2006. Does Good Corporate Governance Include Employee Representation? Evidence from German Corporate Boards. *Journal of Financial Economics* 82(3): 673–710.

- Fich EM. 2005. Are Some Outside Directors Better than Others? Evidence from Director Appointments by Fortune 1000 Firms. *Journal of Business* 78(5): 1943–1971.
- Fich EM, White LJ. 2005. Why do CEOs Reciprocally Sit on Each Other's Boards? *Journal of Corporate Finance* 11: 175–195.
- Fich EM, Shivdasani A. 2006. Are Busy Boards Effective Monitors? *Journal of Finance* 61(2): 689–724.
- Fisman RJ, Khurana R, Rhodes-Kropf M, Yim S. 2013. Governance and CEO Turnover: Do Something or Do the Right Thing? *Management Science* 60(2): 319–337.
- Gorton G, Schmid FA. 2004. Capital, Labor, and the Firm: A Study of German Codetermination. *Journal of the European Economic Association* 2(5): 863–905.
- Goyal VK, Park CW. 2002. Board Leadership Structure and CEO Turnover. *Journal of Corporate Finance* 8(1) 2002: 49–66.
- Greene WH. 2003. *Econometric Analysis*. Prentice Hall: Upper Saddle River, New Jersey.
- Hambrick DC, Fukutomi GDS. 1991. The Seasons of a CEO's Tenure. *Academy of Management Review* 16(4): 719–742.
- Hambrick DC, Cho T, Chen M. 1996. The Influence of Top Management Team Heterogeneity on Firms' Competitive Moves. *Administrative Science Quarterly* 41(4) 1996: 659–684.
- Hambrick DC, Mason PA. 1984. Upper Echelons: The Organization as a Reflection of Its Top Managers. *Academy of Management Review* 9(2): 193–206.
- Hart O. 2001. Financial Contracting. *Journal of Economic Literature* 39(4): 1079–1100.
- Hart, Oliver D. 1983. The Market Mechanism as an Incentive Scheme. *Bell Journal of Economics* 14(2): 366–382.
- Heidrick & Struggles. 2011. European Corporate Governance Report 2011: Challenging Board Performance.
- Heidrick & Struggles. 2014. European Corporate Governance Report 2014: Towards Dynamic Governance.
- Hermalin BE. 2005. Trends in Corporate Governance. *Journal of Finance* 60(5): 2351–2384.
- Hermalin BE, Weisbach MS. 2003. Boards of Directors as an Endogenously Determined Institution: A Survey of the Economic Literature. *Economic Policy Review* 9(1): 7–26.
- Hermalin BE, Weisbach MS. 1998. Endogenously Chosen Boards of Directors and Their Monitoring of the CEO. *American Economic Review* 88(1): 96–118.
- Hosmer DW, Lemeshow S, May S. 2008. *Applied Survival Analysis: Regression Modeling of Time to Event Data*. Wiley-Interscience: Hoboken, New Jersey.

- Hwang B, Kim S. 2009. It Pays to Have Friends. *Journal of Financial Economics* 93(1): 138–158.
- Jiraporn P, Kim YS, Davidson III WN. 2008. Multiple Directorships and Corporate Diversification. *Journal of Empirical Finance* 15(3): 418–435.
- Kalbfleisch JD, Prentice RL. 2002. The Statistical Analysis of Failure Time Data. Wiley: Hoboken, New Jersey.
- Kang H, Cheng M, Gray SJ. 2007. Corporate Governance and Board Composition: Diversity and Independence of Australian Boards. *Corporate Governance: An International Review* 15(2): 194–207.
- Kaplan SN. 1997. Corporate Governance and Corporate Performance: A Comparison of Germany, Japan, and the U.S. *Journal of Applied Corporate Finance* 9(4) 1997: 86–93.
- Karuna C. 2007. Industry Product Market Competition and Managerial Incentives. *Journal of Accounting and Economics* 43(2–3): 275–297.
- Knight D, Pearce CL, Smith KG, Olian JD, Sims HP, Smith KA, Flood P. 1999. Top Management Team Diversity, Group Process, and Strategic Consensus. *Strategic Management Journal* 20(5) 1999: 445–465.
- Kogut B.M. (ed). 2012. *The Small Worlds of Corporate Governance*. MIT Press: Cambridge, Mass.
- Kor YY, Sundaramurthy C. 2009. Experience-Based Human Capital and Social Capital of Outside Directors. *Journal of Management* 35(4): 981–1006.
- Mace ML. 1986. Directors: Myth and Reality. Harvard University Press: Boston, MA.
- Masulis RW, Mobbs S. 2011. Are All Inside Directors the Same? Evidence from the External Directorship Market. *Journal of Finance* 66(3) 2011: 823–872.
- Mizruchi MS. 1996. What Do Interlocks Do? An Analysis, Critique, and Assessment of Research on Interlocking Directorates. *Annual Review of Sociology* 22(1): 271–298.
- Monopolkommission. 2014. Eine Wettbewerbsordnung für die Finanzmärkte: Hauptgutachten 2012/2013.
- Munari F, Oriani R, Sobrero M. 2010. The Effects of Owner Identity and External Governance Systems on R&D Investments: A Study of Western European Firms. *Research Policy* 39(8) 2010: 1093–1104.
- Nickell SJ. 1996. Competition and Corporate Performance. *Journal of Political Economy* 104(4) 1996: 724–46.
- Niederle M, Vesterlund L. 2007. Do Women Shy Away From Competition? Do Men Compete Too Much? *The Quarterly Journal of Economics* 122(3): 1067–1101.
- Perry T, Peyer UC. 2005. Board Seat Accumulation by Executives: A Shareholder's Perspective. *Journal of Finance* 60(4): 2083–2123.

- Rosenstein S, Wyatt JG. 1994. Shareholder Wealth Effects When an Officer of One Corporation Joins the Board of Directors of Another. *Managerial and Decision Economics* 15(4) 1994: 317–327.
- Ryan HE, Wiggins RA. 2004. Who is in Whose Pocket? Director Compensation, Board Independence, and Barriers to Effective Monitoring. *Journal of Financial Economics* 73: 497–524.
- Schmidt KM. 1997. Managerial Incentives and Product Market Competition. *The Review of Economic Studies* 64(2): 191–213.
- Shivdasani A, Yermack D. 1999. CEO Involvement in the Selection of New Board Members: An Empirical Analysis. *Journal of Finance* 54(5): 1829–1853.
- Shleifer A, Vishny RW. 1997. A Survey of Corporate Governance. *Journal of Finance* 52(2): 737–783.
- Talke K, Salomo S, Rost K. 2010. How Top Management Team Diversity Affects Innovativeness and Performance via the Strategic Choice to Focus on Innovation Fields. *Research Policy* 39(7) 2010: 907–918.
- Uddin MB. 2012. Interfirm Cooperation And Information Sharing Through Interlocking Directorates. *Management and Marketing Journal* 10(2): 205–214.
- Useem M, Karabel J. 1986. Pathways to Top Corporate Management. *American Sociological Review* 51(2): 184–200.
- van der Walt N, Ingley C. 2003. Board Dynamics and the Influence of Professional Background, Gender and Ethnic Diversity of Directors. *Corporate Governance: An International Review* 11(3) 2003: 218–234.
- van Reenen JM. 2011. Does Competition Raise Productivity Through Improving Management Quality? *International Journal of Industrial Organization* 29(3): 306–316.
- Weisbach MS. 1988. Outside Directors and CEO Turnover. *Journal of Financial Economics* 20(1/2): 431–460.
- Wooldridge JM. 2010. *Econometric Analysis of Cross Section and Panel Data*. MIT Press: Cambridge, Mass.
- Yermack D. 1996. Higher Market Valuation of Companies with a Small Board of Directors. *Journal of Financial Economics* 40(2): 185–211.
- Yermack D. 2004. Remuneration, Retention, and Reputation Incentives for Outside Directors. *Journal of Finance* 59(5): 2281–2308.

PREVIOUS DISCUSSION PAPERS

- 174 Buchwald, Achim, Competition, Outside Directors and Executive Turnover: Implications for Corporate Governance in the EU, February 2015.
- 173 Buchwald, Achim and Thorwarth, Susanne, Outside Directors on the Board, Competition and Innovation, February 2015.
- 172 Dewenter, Ralf and Giessing, Leonie, The Effects of Elite Sports Participation on Later Job Success, February 2015.
- 171 Haucap, Justus, Heimeshoff, Ulrich and Siekmann, Manuel, Price Dispersion and Station Heterogeneity on German Retail Gasoline Markets, January 2015.
- 170 Schweinberger, Albert G. and Suedekum, Jens, De-Industrialisation and Entrepreneurship under Monopolistic Competition, January 2015.
- 169 Nowak, Verena, Organizational Decisions in Multistage Production Processes, December 2014.
- 168 Benndorf, Volker, Kübler, Dorothea and Normann, Hans-Theo, Privacy Concerns, Voluntary Disclosure of Information, and Unraveling: An Experiment, November 2014. Forthcoming in: European Economic Review.
- 167 Rasch, Alexander and Wenzel, Tobias, The Impact of Piracy on Prominent and Non-prominent Software Developers, November 2014. Forthcoming in: Telecommunications Policy.
- 166 Jeitschko, Thomas D. and Tremblay, Mark J., Homogeneous Platform Competition with Endogenous Homing, November 2014.
- 165 Gu, Yiquan, Rasch, Alexander and Wenzel, Tobias, Price-sensitive Demand and Market Entry, November 2014. Forthcoming in: Papers in Regional Science.
- 164 Caprice, Stéphane, von Schlippenbach, Vanessa and Wey, Christian, Supplier Fixed Costs and Retail Market Monopolization, October 2014.
- 163 Klein, Gordon J. and Wendel, Julia, The Impact of Local Loop and Retail Unbundling Revisited, October 2014.
- 162 Dertwinkel-Kalt, Markus, Haucap, Justus and Wey, Christian, Raising Rivals' Costs Through Buyer Power, October 2014. Published in: Economics Letters, 126 (2015), pp.181-184.
- 161 Dertwinkel-Kalt, Markus and Köhler, Katrin, Exchange Asymmetries for Bads? Experimental Evidence, October 2014.
- 160 Behrens, Kristian, Mion, Giordano, Murata, Yasusada and Suedekum, Jens, Spatial Frictions, September 2014.
- 159 Fonseca, Miguel A. and Normann, Hans-Theo, Endogenous Cartel Formation: Experimental Evidence, August 2014. Published in: Economics Letters, 125 (2014), pp. 223-225.
- 158 Stiebale, Joel, Cross-Border M&As and Innovative Activity of Acquiring and Target Firms, August 2014.

- 157 Haucap, Justus and Heimeshoff, Ulrich, The Happiness of Economists: Estimating the Causal Effect of Studying Economics on Subjective Well-Being, August 2014.
Published in: International Review of Economics Education, 17 (2014), pp. 85-97.
- 156 Haucap, Justus, Heimeshoff, Ulrich and Lange, Mirjam R. J., The Impact of Tariff Diversity on Broadband Diffusion – An Empirical Analysis, August 2014.
- 155 Baumann, Florian and Friehe, Tim, On Discovery, Restricting Lawyers, and the Settlement Rate, August 2014.
- 154 Hottenrott, Hanna and Lopes-Bento, Cindy, R&D Partnerships and Innovation Performance: Can There be too Much of a Good Thing?, July 2014.
- 153 Hottenrott, Hanna and Lawson, Cornelia, Flying the Nest: How the Home Department Shapes Researchers' Career Paths, July 2014.
- 152 Hottenrott, Hanna, Lopes-Bento, Cindy and Veugelers, Reinhilde, Direct and Cross-Scheme Effects in a Research and Development Subsidy Program, July 2014.
- 151 Dewenter, Ralf and Heimeshoff, Ulrich, Do Expert Reviews Really Drive Demand? Evidence from a German Car Magazine, July 2014.
Forthcoming in: Applied Economics Letters.
- 150 Bataille, Marc, Steinmetz, Alexander and Thorwarth, Susanne, Screening Instruments for Monitoring Market Power in Wholesale Electricity Markets – Lessons from Applications in Germany, July 2014.
- 149 Kholodilin, Konstantin A., Thomas, Tobias and Ulbricht, Dirk, Do Media Data Help to Predict German Industrial Production?, July 2014.
- 148 Hogrefe, Jan and Wrona, Jens, Trade, Tasks, and Trading: The Effect of Offshoring on Individual Skill Upgrading, June 2014.
Forthcoming in: Canadian Journal of Economics.
- 147 Gaudin, Germain and White, Alexander, On the Antitrust Economics of the Electronic Books Industry, September 2014 (Previous Version May 2014).
- 146 Alipranti, Maria, Milliou, Chrysovalantou and Petrakis, Emmanuel, Price vs. Quantity Competition in a Vertically Related Market, May 2014.
Published in: Economics Letters, 124 (2014), pp. 122-126.
- 145 Blanco, Mariana, Engelmann, Dirk, Koch, Alexander K. and Normann, Hans-Theo, Preferences and Beliefs in a Sequential Social Dilemma: A Within-Subjects Analysis, May 2014.
Published in: Games and Economic Behavior, 87 (2014), pp. 122-135.
- 144 Jeitschko, Thomas D., Jung, Yeonjei and Kim, Jaesoo, Bundling and Joint Marketing by Rival Firms, May 2014.
- 143 Benndorf, Volker and Normann, Hans-Theo, The Willingness to Sell Personal Data, April 2014.
- 142 Dauth, Wolfgang and Suedekum, Jens, Globalization and Local Profiles of Economic Growth and Industrial Change, April 2014.
- 141 Nowak, Verena, Schwarz, Christian and Suedekum, Jens, Asymmetric Spiders: Supplier Heterogeneity and the Organization of Firms, April 2014.
- 140 Hasnas, Irina, A Note on Consumer Flexibility, Data Quality and Collusion, April 2014.

- 139 Baye, Irina and Hasnas, Irina, Consumer Flexibility, Data Quality and Location Choice, April 2014.
- 138 Aghadadashli, Hamid and Wey, Christian, Multi-Union Bargaining: Tariff Plurality and Tariff Competition, April 2014.
- 137 Duso, Tomaso, Herr, Annika and Suppliet, Moritz, The Welfare Impact of Parallel Imports: A Structural Approach Applied to the German Market for Oral Anti-diabetics, April 2014.
Published in: Health Economics, 23 (2014), pp. 1036-1057.
- 136 Haucap, Justus and Müller, Andrea, Why are Economists so Different? Nature, Nurture and Gender Effects in a Simple Trust Game, March 2014.
- 135 Normann, Hans-Theo and Rau, Holger A., Simultaneous and Sequential Contributions to Step-Level Public Goods: One vs. Two Provision Levels, March 2014.
Forthcoming in: Journal of Conflict Resolution.
- 134 Bucher, Monika, Hauck, Achim and Neyer, Ulrike, Frictions in the Interbank Market and Uncertain Liquidity Needs: Implications for Monetary Policy Implementation, July 2014 (First Version March 2014).
- 133 Czarnitzki, Dirk, Hall, Bronwyn, H. and Hottenrott, Hanna, Patents as Quality Signals? The Implications for Financing Constraints on R&D?, February 2014.
- 132 Dewenter, Ralf and Heimeshoff, Ulrich, Media Bias and Advertising: Evidence from a German Car Magazine, February 2014.
Published in: Review of Economics, 65 (2014), pp. 77-94.
- 131 Baye, Irina and Sapi, Geza, Targeted Pricing, Consumer Myopia and Investment in Customer-Tracking Technology, February 2014.
- 130 Clemens, Georg and Rau, Holger A., Do Leniency Policies Facilitate Collusion? Experimental Evidence, January 2014.
- 129 Hottenrott, Hanna and Lawson, Cornelia, Fishing for Complementarities: Competitive Research Funding and Research Productivity, December 2013.
- 128 Hottenrott, Hanna and Rexhäuser, Sascha, Policy-Induced Environmental Technology and Inventive Efforts: Is There a Crowding Out?, December 2013.
- 127 Dauth, Wolfgang, Findeisen, Sebastian and Suedekum, Jens, The Rise of the East and the Far East: German Labor Markets and Trade Integration, December 2013.
Published in: Journal of the European Economic Association, 12 (2014), pp. 1643-1675.
- 126 Wenzel, Tobias, Consumer Myopia, Competition and the Incentives to Unshroud Add-on Information, December 2013.
Published in: Journal of Economic Behavior and Organization, 98 (2014), pp. 89-96.
- 125 Schwarz, Christian and Suedekum, Jens, Global Sourcing of Complex Production Processes, December 2013.
Published in: Journal of International Economics, 93 (2014), pp. 123-139.
- 124 Defever, Fabrice and Suedekum, Jens, Financial Liberalization and the Relationship-Specificity of Exports, December 2013.
Published in: Economics Letters, 122 (2014), pp. 375-379.

- 123 Bauernschuster, Stefan, Falck, Oliver, Heblich, Stephan and Suedekum, Jens, Why Are Educated and Risk-Loving Persons More Mobile Across Regions?, December 2013.
Published in: Journal of Economic Behavior and Organization, 98 (2014), pp. 56-69.
- 122 Hottenrott, Hanna and Lopes-Bento, Cindy, Quantity or Quality? Knowledge Alliances and their Effects on Patenting, December 2013.
Forthcoming in: Industrial and Corporate Change.
- 121 Hottenrott, Hanna and Lopes-Bento, Cindy, (International) R&D Collaboration and SMEs: The Effectiveness of Targeted Public R&D Support Schemes, December 2013.
Published in: Research Policy, 43 (2014), pp.1055-1066.
- 120 Giesen, Kristian and Suedekum, Jens, City Age and City Size, November 2013.
Published in: European Economic Review, 71 (2014), pp. 193-208.
- 119 Trax, Michaela, Brunow, Stephan and Suedekum, Jens, Cultural Diversity and Plant-Level Productivity, November 2013.
- 118 Manasakis, Constantine and Vlassis, Minas, Downstream Mode of Competition with Upstream Market Power, November 2013.
Published in: Research in Economics, 68 (2014), pp. 84-93.
- 117 Sapi, Geza and Suleymanova, Irina, Consumer Flexibility, Data Quality and Targeted Pricing, November 2013.
- 116 Hinloopen, Jeroen, Müller, Wieland and Normann, Hans-Theo, Output Commitment Through Product Bundling: Experimental Evidence, November 2013.
Published in: European Economic Review, 65 (2014), pp. 164-180.
- 115 Baumann, Florian, Denter, Philipp and Friehe Tim, Hide or Show? Endogenous Observability of Private Precautions Against Crime When Property Value is Private Information, November 2013.
- 114 Fan, Ying, Kühn, Kai-Uwe and Lafontaine, Francine, Financial Constraints and Moral Hazard: The Case of Franchising, November 2013.
- 113 Aguzzoni, Luca, Argentesi, Elena, Buccirossi, Paolo, Ciari, Lorenzo, Duso, Tomaso, Tognoni, Massimo and Vitale, Cristiana, They Played the Merger Game: A Retrospective Analysis in the UK Videogames Market, October 2013.
Published in: Journal of Competition Law and Economics under the title: "A Retrospective Merger Analysis in the UK Videogame Market", (10) (2014), pp. 933-958.
- 112 Myrseth, Kristian Ove R., Riener, Gerhard and Wollbrant, Conny, Tangible Temptation in the Social Dilemma: Cash, Cooperation, and Self-Control, October 2013.
- 111 Hasnas, Irina, Lambertini, Luca and Palestini, Arsen, Open Innovation in a Dynamic Cournot Duopoly, October 2013.
Published in: Economic Modelling, 36 (2014), pp. 79-87.
- 110 Baumann, Florian and Friehe, Tim, Competitive Pressure and Corporate Crime, September 2013.
- 109 Böckers, Veit, Haucap, Justus and Heimeshoff, Ulrich, Benefits of an Integrated European Electricity Market, September 2013.

- 108 Normann, Hans-Theo and Tan, Elaine S., Effects of Different Cartel Policies: Evidence from the German Power-Cable Industry, September 2013.
Published in: Industrial and Corporate Change, 23 (2014), pp. 1037-1057.
- 107 Haucap, Justus, Heimeshoff, Ulrich, Klein, Gordon J., Rickert, Dennis and Wey, Christian, Bargaining Power in Manufacturer-Retailer Relationships, September 2013.
- 106 Baumann, Florian and Friehe, Tim, Design Standards and Technology Adoption: Welfare Effects of Increasing Environmental Fines when the Number of Firms is Endogenous, September 2013.
- 105 Jeitschko, Thomas D., NYSE Changing Hands: Antitrust and Attempted Acquisitions of an Erstwhile Monopoly, August 2013.
Published in: Journal of Stock and Forex Trading, 2 (2) (2013), pp. 1-6.
- 104 Böckers, Veit, Giessing, Leonie and Rösch, Jürgen, The Green Game Changer: An Empirical Assessment of the Effects of Wind and Solar Power on the Merit Order, August 2013.
- 103 Haucap, Justus and Muck, Johannes, What Drives the Relevance and Reputation of Economics Journals? An Update from a Survey among Economists, August 2013.
- 102 Jovanovic, Dragan and Wey, Christian, Passive Partial Ownership, Sneaky Takeovers, and Merger Control, August 2013.
Published in: Economics Letters, 125 (2014), pp. 32-35.
- 101 Haucap, Justus, Heimeshoff, Ulrich, Klein, Gordon J., Rickert, Dennis and Wey, Christian, Inter-Format Competition Among Retailers – The Role of Private Label Products in Market Delineation, August 2013.
- 100 Normann, Hans-Theo, Requate, Till and Waichman, Israel, Do Short-Term Laboratory Experiments Provide Valid Descriptions of Long-Term Economic Interactions? A Study of Cournot Markets, July 2013.
Published in: Experimental Economics, 17 (2014), pp. 371-390.
- 99 Dertwinkel-Kalt, Markus, Haucap, Justus and Wey, Christian, Input Price Discrimination (Bans), Entry and Welfare, June 2013.
- 98 Aguzzoni, Luca, Argentesi, Elena, Ciari, Lorenzo, Duso, Tomaso and Tognoni, Massimo, Ex-post Merger Evaluation in the UK Retail Market for Books, June 2013.
Forthcoming in: Journal of Industrial Economics.
- 97 Caprice, Stéphane and von Schlippenbach, Vanessa, One-Stop Shopping as a Cause of Slotting Fees: A Rent-Shifting Mechanism, May 2012.
Published in: Journal of Economics and Management Strategy, 22 (2013), pp. 468-487.
- 96 Wenzel, Tobias, Independent Service Operators in ATM Markets, June 2013.
Published in: Scottish Journal of Political Economy, 61 (2014), pp. 26-47.
- 95 Coublucq, Daniel, Econometric Analysis of Productivity with Measurement Error: Empirical Application to the US Railroad Industry, June 2013.
- 94 Coublucq, Daniel, Demand Estimation with Selection Bias: A Dynamic Game Approach with an Application to the US Railroad Industry, June 2013.
- 93 Baumann, Florian and Friehe, Tim, Status Concerns as a Motive for Crime?, April 2013.

- 92 Jeitschko, Thomas D. and Zhang, Nanyun, Adverse Effects of Patent Pooling on Product Development and Commercialization, April 2013.
Published in: The B. E. Journal of Theoretical Economics, 14 (1) (2014), Art. No. 2013-0038.
- 91 Baumann, Florian and Friehe, Tim, Private Protection Against Crime when Property Value is Private Information, April 2013.
Published in: International Review of Law and Economics, 35 (2013), pp. 73-79.
- 90 Baumann, Florian and Friehe, Tim, Cheap Talk About the Detection Probability, April 2013.
Published in: International Game Theory Review, 15 (2013), Art. No. 1350003.
- 89 Pagel, Beatrice and Wey, Christian, How to Counter Union Power? Equilibrium Mergers in International Oligopoly, April 2013.
- 88 Jovanovic, Dragan, Mergers, Managerial Incentives, and Efficiencies, April 2014 (First Version April 2013).
- 87 Heimeshoff, Ulrich and Klein Gordon J., Bargaining Power and Local Heroes, March 2013.
- 86 Bertschek, Irene, Cerquera, Daniel and Klein, Gordon J., More Bits – More Bucks? Measuring the Impact of Broadband Internet on Firm Performance, February 2013.
Published in: Information Economics and Policy, 25 (2013), pp. 190-203.
- 85 Rasch, Alexander and Wenzel, Tobias, Piracy in a Two-Sided Software Market, February 2013.
Published in: Journal of Economic Behavior & Organization, 88 (2013), pp. 78-89.
- 84 Bataille, Marc and Steinmetz, Alexander, Intermodal Competition on Some Routes in Transportation Networks: The Case of Inter Urban Buses and Railways, January 2013.
- 83 Haucap, Justus and Heimeshoff, Ulrich, Google, Facebook, Amazon, eBay: Is the Internet Driving Competition or Market Monopolization?, January 2013.
Published in: International Economics and Economic Policy, 11 (2014), pp. 49-61.

Older discussion papers can be found online at:
<http://ideas.repec.org/s/zbw/dicedp.html>

Heinrich-Heine-University of Düsseldorf

**Düsseldorf Institute for
Competition Economics (DICE)**

Universitätsstraße 1 _ 40225 Düsseldorf
www.dice.hhu.de