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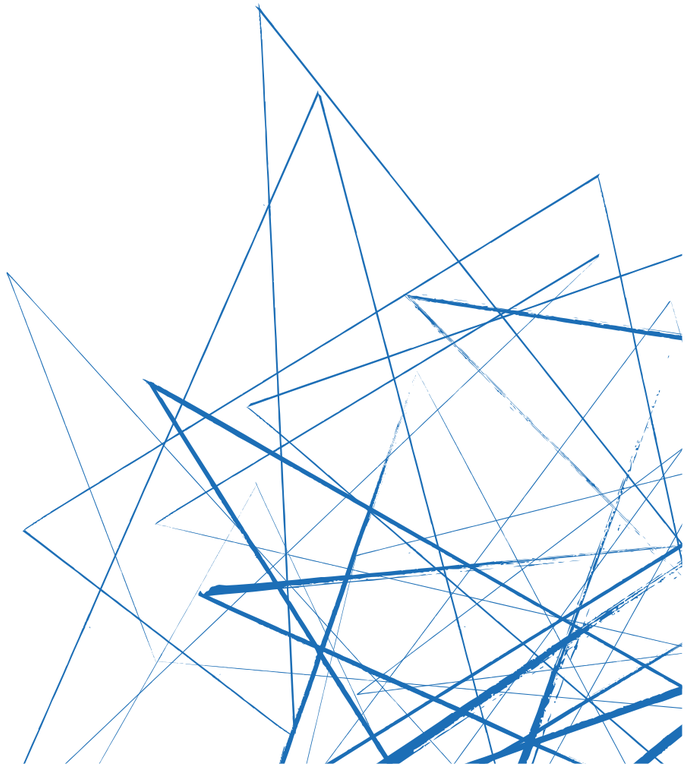

A WORKER-CENTERED INQUIRY INTO THE CONTINGENCIES AND CONSEQUENCES OF WORKER REPRESENTATION

PhD Series 38.2022

Casper Berg Lavmand Larsen

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Center for Corporate Governance, Department of Accounting | **PhD Series 38.2022**

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HANDELSHØJSKOLEN

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Foreword

Research is in my experience a highly involved and personal process where forums of free speech are immensely consequential for a creative research environment. In addition to incredible academic mentorship, I want first and foremost to thank Thomas Poulsen for creating exactly that – a forum of free speech that allows the development and testing of even the most impulsive and unconventional ideas. Moreover, I want to thank Aleksandra Gregorič for placing great faith in my academic ambitions and generously inviting me into an article collaboration from which I have learned enormously about the process of developing a research idea and how to balance theoretical grid with research designs and empirical constraints.
Both Thomas Poulsen and Aleksandra Gregorič's willingness to openly reflect on their personal experiences in research have helped me hugely in reflecting on myself as a researcher.

Niels Westergård-Nielsen was the first person to introduce me to research and has generously shared experiences with data work, academic virtues, and incredible storytelling. For all of this, I am very grateful. Also, I want to express gratitude to all my colleagues at Copenhagen Business School. Especially, I want to thank Niels Hulgård, Anne Sophie Schytt Lassen, Esther Chevrot-Bianco, and Jasmin Dayeh for friendship and intellectual companionship – I feel incredibly lucky that I got to share the Ph.d. journey with you.
In the duration of my Ph.d., I have had the honor of meeting a number of generous and thought-provoking scholars including Douglas Kruse, Joseph Blasi, and

Guido Friebel. Besides your ability to challenge my perceptions and beliefs, what I will forever treasure is how you all manifested success in a competitive industry while staying both generous and humble while at the same time innovating literature.

Finally – but certainly not least – I want to thank my boyfriend Marc Oskar Ryning for his love and irrepressible optimism. I am forever grateful to have you in my life.

English Abstract

Unions and workers' prior experience with BLWR play a key role in overcoming coordination issues ahead of first-time BLWR implementations, workers experience higher engagement and motivation as they are granted the right to worker representation, and BLWR firms hire more managerial talent internal the firm and provide more career opportunities for firm-workers as a result. These are all key findings from the three individual articles of this dissertation on contingencies and consequences of worker representation.

In the first article, *Workers' Capability for Voice and Board-Level Worker Representation (BLWR) Contingencies*, I question if the absence of worker representation on the board level in 76% of firms subject to regulation can be explained by a lack of capabilities for voice among firm workers. Theoretically motivated by Bonvin (2012), I specifically examine the role of workers' knowledge about BLWR, strong family values on the board of directors, and workers' socio-economic status. I analyze the role of workers' capabilities in a rare event study using administrative employer-worker data from 2003-2017. In the article, I arrive at two key findings. I find workers' knowledge about BLWR from personal experience in prior employment relations matters for first-time BLWR implementation both in firms i) with family members on the board of directors and ii) with a high degree of unionization.

In the *Worker Representation and Job Quality*, the second article of the dissertation, together with Esther Chevrot-Bianco I examine if workers' right to representation in the board of directors and cooperation committee improves job quality for workers. Thus far, the literature has found almost no effects from worker representa-

tion on worker outcomes such as separation rates, absenteeism, and wages. For this reason, we focus on questionnaire outcomes of workers' job quality including workers' concerns of job loss and involuntary moves, work-life balance, planning, and organization of work, and work engagement and motivation from a nationally representative survey data (N=38,000). In the article, we exploit a discontinuity in the regulation and implement a regression discontinuity design. We find, that unions play an almost indispensable role in the implementation of BLWR and that the right to representation enhances work engagement and motivation for firm workers.

Finally, in the third article *Participatory Practices and External Hires to Managerial Positions* with Aleksandra Gregorič and Takao Kato, I question if firms with board-level worker representatives (BLWR) – that is, firms with participatory practices – hire more managerial talent internally the firm (as opposed to externally) compared to non-BLWR firms. We propose three theoretical mechanisms for the hiring strategies in firms with participatory practices. First, understanding norms and culture specific to firms with participatory practices is important when hiring managers. Second, improved information flows between workers and those in charge of hires on all organizational levels. And third, that firms with participatory practices are more concerned with wage inequality within each worker-level and rely more on promotions to motivate workers as a result. We estimate a two-step firm fixed-effects model on administrative employer-worker data for the period 2001-2017 to explain the time-invariant component of firms' hiring strategy. In the article we find, that firms with participatory practices are more inclined to hire managerial talent – both for the wider managerial team and the top managers –

internally the firm (as opposed to externally). Further, we find, that firms with participatory practices do not have access to poorer external candidates and thus reject this as an explanation for our primary result.

Danish Abstract

Fagforeninger såvel som medarbejderes viden om medarbejderrepræsentation i bestyrelsen er afgørende for at overkomme koordinationsproblemer i forbindelse med førstegangsimplementering af medarbejderrepræsentation i den enkelte virksomhed, medarbejdere oplever øget engagement og motivation når de sikres retten til medarbejderrepræsentation og en øget tilbøjelighed for intern rekruttering af ledelsestalent i virksomheder med medarbejderrepræsentation. Det er alle centrale resultater fra de individuelle artikler, der tilsammen udgør denne afhandling om forhindringer for og konsekvenser af medarbejderrepræsentation.

I den første artikel, Workers' Capability for Voice and Board-Level Worker Representation (BLWR) Contingencies, undersøger jeg om fraværet af formel medarbejderrepræsentation i bestyrelsen i 76% af virksomhederne omfattet af lovgivningen skyldes mangel på kapabiliteter relevante for indflydelse blandt medarbejderene. Teoretisk motiveret af Bonvin (2012), undersøger jeg specifikt betydningen af medarbejderes viden om medarbejderrepræsentation, stærke familieværdier i bestyrelsen samt medarbejderes socioøkonomiske status. Empirisk analyserer jeg betydningen af disse kapabiliteter i et event-studie med baseret på administrativt data for medarbejdere of arbejdsgivere i perioden 2003-2017. I artiklen kommer jeg frem til to centrale resultater. Medarbejders viden om medarbejderrepræsentation er afgørende for, om medarbejderrepræsentation etableres i virksomheder med i) familiemedlemmer i bestyrelsen og ligeledes i virksomheder med høj ii) fagforeningstilslutning.

I afhandlingens anden artikel, Worker Representation and Job Quality, undersøger

jeg med Esther Chevrot-Bianco hvorvidt medarbejders ret til repræsentation i bestyrelsen og samarbejdsudvalg forbedrer medarbejderens arbejdskvalitet. Den eksisterende litteratur har, med få undtagelser, ikke fundet effekter af medarbejderrepræsentation på medarbejderforhold som for eksempel separationsrater, sygefravær og lønninger. Derfor fokuserer vi i artiklen på en anden type af effekter, nemlig spørgeskemabesvarelser fra et repræsentativt nationalt spørgeskema (N=38.000) om medarbejderes bekymring for tab af job og ufrivillige flytninger, balance mellem arbejde og privatliv, planlægning og tilrettelæggelse af arbejde samt engagement og motivation på arbejdet. I artiklen udnytter vi en diskontinuitet i reguleringen af medarbejderrepræsentation og implementerer et regressionsdiskontinuitetsdesign. Vi finder, at fagforeninger spiller en næsten uundværlig rolle i implementeringen af repræsentation i bestyrelser samt at retten til medarbejderrepræsentation øger engagement og motivation på arbejdet.

Den tredje og sidste artikel, Participatory Practices and External Hires to Managerial Positions, er et samarbejde med Aleksandra Gregorič og Takao Kato. I artiklen undersøger vi om virksomheder med medarbejderrepræsentation i bestyrelsen – det vil sige virksomheder med medarbejderinddragelse – er mere tilbøjelige til at ansætte ledere internt fra virksomheden (i modsætning til eksternt) sammenlignet med virksomheder uden medarbejderrepræsentation i bestyrelsen. Vi foreslår tre teoretiske mekanismer for ansættelsesstrategier i virksomheder med medarbejderinddragelse. For det første foreslår vi, at erfaring normer og kulturer specifikke for medarbejderinddragelse er væsentlig for forudsætning for nye ledere. For det andet, at medarbejderinddragelse forbedrer informationsstrømme mellem medarbejdere og ansvarlige for ansættelser på alle organisatoriske niveauer. Og

for det tredje, at virksomheder med medarbejderinddragelse er mere optaget af lønulighed indenfor stillingsniveauer, og derfor mere tilbøjelige til at motivere medarbejdere gennem forfremmelser frem for lønstigninger. Vi estimerer en to-trins model med fixed effects på administrativt data for medarbejdere og arbejdsgivere i perioden 2001-2017 for at forklare den tidsinvariante del af virksomhedernes ansættelsesstrategi. I artiklen finder vi, at virksomheder med medarbejderinddragelse er mere tilbøjelige til at ansætte ledelsestalent – både for det bredere ledelsesteam samt topledere – internt i virksomheden (i modsætning til eksternt). Endeligt finder vi, at virksomheder med medarbejderinddragelse ikke har adgang til dårligere eksterne lederkandidater, og afviser dermed denne alternative forklaring af vores centrale resultat.

Contents

Chapter 1

General introduction

1.1 Focus on worker contingencies and consequences

Paradoxically, the worker representation[1] literature in industrial relations, labor economics, and corporate governance journals focuses surprisingly little on... the workers. That is, the literature has little focus on outcomes not directly related to firms' financial performance or the distribution of financial rents such as wages (Conchon, 2011; Jäger et al., 2021; Addison, 2009; Gorton and Schmid, 2004). For instance, only Harju et al. (2021) have studied the effects of worker representation on questionnaire-based outcomes on workers' job quality. In the mid-1970s, board-level worker representation was injected into shareholder-oriented governance models in many continental European countries, and this likely explains the literature's urge to focus exactly on the financial consequences for shareholders.

[1]Unless explicitly stated, I refer to worker representation on board level throughout the dissertation. In Denmark, firms are governed by a two-tier system with a supervisory board and an executive board. Workers in firms larger than 35 workers have the right (but not the obligation) to elect worker representatives to the (supervisory) board of directors.

In the U.S., a country granting no board-level representation rights to workers, workers express considerable demand for formal representation (Harju et al., 2021) even though we have very little evidence, that worker representation is an effective mechanism for protecting workers in the private sector nor what kind of contingencies that are involved (Jäger et al., 2021). This, I think, calls for a redirection of focus in the future literature on worker representation towards a greater emphasis on worker outcomes and a deeper understanding of the functioning of worker representation as a governance mechanism. This dissertation is all about the contingencies workers face as they reach for formal representation and the consequences worker representation has on worker outcomes.

It is incredibly difficult to know the kind of influence – if any – granted to workers with the right to elect representatives on the board of directors as well as the functioning of worker representation more generally. In most regulative systems granting workers the right to representation in the board of directors (such as Finland, Germany, and Denmark), workers can elect a minority of the board of director seats. In Denmark – the context of all articles of this dissertation – this minority cannot exceed one-third of the total seats on the board of directors as specified in the Danish Companies Act. This of course comes with limitations on workers' potential influence, as it is contingent on opportunities for coalitions and the readiness of shareholder-elected directors to listen. Furthermore, literature has documented a great deal of firm-level heterogeneity – determined by unions' coordinating role and the traditions of family firms among other factors (Gregorič and Poulsen, 2020) – in the probability that board-level worker representation (BLWR) is adopted. Other factors largely uncovered in the literature are the agendas and

motives of workers elected to the board of directors, the kind of capabilities it requires for workers to elect representatives and succeed in the boardroom, and the way greater worker participation influences the practices of other directors and the greater managerial team.

In this dissertation I take a step back, disregard financial firm performance indicators for a moment, and zoom in on the workers' side of worker representation; what are the contingencies for workers as they reach for board influence in the first place, what are the implications for workers' job quality, and does it affect internal hiring of managerial talent among workers? As I learned about the worker representation literature, several questions arose, and some of those questions turned into the articles of this dissertation. In this first part of the general introduction I want to reflect on the – to me – more significant observations and the kind of questions that were triggered.

One of the first striking observations I made, is the lack of implementation in the vast majority of firms where workers have the right (but not the obligation) to elect board-level representatives. In fact, only 25% of Danish firms subject to BLWR legislation have implemented BLWR as documented in the first article *Workers' Capability for Voice and Board-Level Worker Representation (BLWR) Contingencies*. Literature has focused on unions' important role of coordinating workers' efforts, strong family traditions in family firms, and the supply of worker candidates among other aspects (Conchon, 2011; Jäger et al., 2021; Addison, 2009; Gorton and Schmid, 2004; Gregorič and Poulsen, 2020). But what about the lack of incentive for individual workers to represent firm workers at large, the limited impact of worker representatives once elected, worker representatives' potential conflicts with dissatisfied

colleagues, and the lack of capabilities to take on a board position for large groups of workers? The latter idea – the lack of capabilities among workers to solve the coordination problem and ultimately to sit alongside shareholder-elected representatives on the board of directors – turned into my first article *Workers' Capability for Voice and Board-Level Worker Representation (BLWR) Contingencies*. Here I analyze the kind of capabilities – political resources, cognitive resources, and the readiness of interlocutors to listen – actual implementation of BLWR hinges on, by studying the events of first-time implementation of BLWR.

At first glance, the appeal of worker representation appears prosperous for the workers. And perhaps this is why Thomas Piketty, Elizabeth Warren, and others (Bryson and Freeman, 2012; Kochan et al., 2019; Adhvaryu et al., 2019) advocate for worker representation on board-level as a key response to workers' impaired bargaining power (Stansbury and Summers, 2020) and increasing inequality (Bryson and Freeman, 2012). But what is the reality of the effectiveness of worker representation to protect workers in the private sector? Another significant observation I made, is the lack of effects of worker representation in the board of directors on worker outcomes such as wages, absenteeism, separations, and sickness leave in existing literature (e.g. Blandhol et al. (2020) & Jäger et al. (2019)). Blandhol et al. (2020) find no effect of worker representation on wages nor earnings risks, that is, risk of losing jobs and/or wage cuts in a Norwegian context, and Jäger et al. (2019) find no effect on neither average wages, wage compression, labor share, nor the degree of worker rent-seeking in a German context. Not only does this raise the question of why unions, think tanks, and politicians keep advocating for BLWR and workers keep electing representatives when effects for workers are largely ab-

sent, it too raises the question if we understand the ends pursued by board-level worker representatives. In countries like Denmark, wages and several other contractual terms are agreed upon in collective agreements through three-part negotiations with unions, government representatives, and the employers' organization, and perhaps similar arrangements is part of the reason why literature has found no effects on e.g. wages. As a result, in my second article *Worker Representation and Job Quality*, together with Esther Chevrot-Bianco I turn to questionnaire outcomes on workers' job quality hardly examined in the board-level worker representation literature thus far. In the article, we study the causal link between worker representation on the board of directors and the cooperation committee to four areas of workers' job quality; planning and organization of work, engagement in work, concerns of job loss and involuntary moves, and work-life balance.

We know little about how worker representation manifests itself in the boardroom and what types of decisions and practices are affected with a larger degree of worker participation (see Bryson and Freeman (2012) and Kochan et al. (2019) for a general overview). This motivated the third article on the implications of worker representation in the board of directors on managerial practices. In my third article *Participatory Practices and External Hires to Managerial Positions* together with Aleksandra Gregorič and Takao Kato, I examine a quite specific side to managerial practices namely the tendency to hire managerial talent internally (as opposed to externally) the firm for BLWR and non-BLWR firms. Or as we frame it, in firms with a high and low degree of worker participatory practices. Though the relevance of this research question may be hard to see at first, it relates to key areas of the board-level worker representation and personnel economics literature includ-

ing how firms source talent, and retain and motivate internal workers through promotions.

Towards the end of this general introduction, I follow up on some of the reflections discussed here that did not make it to any of the three articles and formulate a number of research questions that I think are relevant to further advance the understanding of worker representation in the years to come.
I do not provide a general review of literature related to the topics of this dissertation in the general introduction but are instead included in each of the articles separately. Although all articles of the dissertation address questions related to worker representation, topics – and as a result the related literature – are separated from each other.

1.2 Research questions

The research questions of the dissertation are narrowed down to three main questions; one for each article. Further, all three research questions are pinned out in several sub-questions as described in this section.
In the first article, I question if the implementation of worker representation on the board of directors hinges on certain capabilities among workers. Specifically, I analyze the role of political resources, cognitive resources, and the readiness of interlocutors to listen. Later in the article, when analyzing potential heterogeneity in findings, I question if findings are contingent on the degree of unionization and ownership of families, among other things. In the second article, we question if worker representation causes greater job quality among workers. This question is

broken down into three sub-questions. First, we question if unionization among other factors mitigates the implementation of worker representation on the board of directors. Second, we question if workers' right to representation, regardless of implementation on the firm level, causes greater job quality among workers. As in the first paper, we also subsequently question if findings are contingent on the degree of unionization and ownership of families, among other things. Finally, in the third article, we question if firms with worker representation on the board of directors (participatory practicing firms) are more inclined to hire management talent internally than externally the firm. We follow up by questioning if the inclination of firms with worker directors to recruit internally is associated with greater talent development of workers internally in the firms.

1.3 Research design strategies and validity of results

In the dissertation, I implement empirical research designs, including some quasi-experimental designs, on large-scale administrative register data provided by Statistics Denmark. When board-level worker representation was first introduced in the mid-1970s data was in shortage and it left few opportunities for studying implications as a result. Today's data availability allows for much richer analysis even though more creativity is required in terms of empirical identification strategies. I want in this section to give an idea of the empirical strategies employed in the individual articles of this dissertation. First, in the *Workers' Capability for Voice and Board-Level Worker Representation (BLWR) Contingencies* article, I implement a penalized maximum likelihood fixed-effects (PML-FE) estimator to exploit the variation,

however rare, in first-time BLWR adoptions on firm-level. By relying on the penalized maximum likelihood fixed-effects estimator, I get to carry out an event study despite the rare nature of first-time BLWR adoptions at the firm level. And with the control of firm fixed-effects, I get to focus on the variation in the worker capabilities studied in this article rather than time-invariant firm characteristics. With Esther Chevrot-Bianco, I implement a regression discontinuity design in the second article exploiting the discontinuity in BLWR regulation granting only workers in firms larger than 35 workers the right to elect representations on the board of directors. The design is an example of a quasi-experimental design where we assume a randomized allocation of firms just below and above the 35-worker threshold. Finally, in the third article, we estimate the long-term and time-invariant impact of BLWR on firms' tendency to hire managerial talent internal the firm by implementing a two-stage FE model. In the first stage, we estimate a linear probability model on firms' decision to hire an internal as opposed to an external candidate with firm fixed-effects before estimating the effect of BLWR on these very firm fixed-effects in the second stage. We have chosen this design both because we are interested in the long-term effects of BLWR and because the literature on firms' hiring policies consistently reports that firm-level heterogeneity remains largely unexplained.

While the fortunes of these quasi-experimental designs, such as the regression discontinuity design, are the high credibility of causal claims and internal validity, the external validity often is limited and requires additional extrapolation assumptions. Common for all three articles is the study of minority worker representation on the board of directors. One cannot generalize results to other institutional contexts – such as the one in Finland – without making further assumptions on the

importance of the right's strength. Although Finland grants workers minority representation on board-level as in Denmark, Finland allow workers to elect a maximum of 20% of seats on the board of directors whereas the same number is 33% in Denmark. Another example is the study of average treatment effects for firms at the 35-worker cutoff in the second article *Worker Representation and Job Quality*. Unless one is prepared to accept extrapolation assumptions like homogeneity of the treatment effect across firm sizes, we cannot generalize the results of this paper to estimate the overall average effect of the treatment.

1.4 Presentation of individual articles

In this section, I present the three individual articles of the dissertation in summary. Though the articles are all distinct research projects, there is a natural progression between the articles. In the first article, I analyze variation in workers' capability around the time of BLWR implementation to better understand why BLWR is not implemented in the majority of firms subject to legislation. In the second and third articles, I analyze the implications of BLWR once fully integrated; in the second article, I analyze effects on workers' job quality whereas the third article focuses on the consequences of firms' hiring practices of managerial talent.

1.4.1 Workers' Capability for Voice and Board-Level Worker Representation (BLWR) Contingencies

Is workers' real freedom to reach for board-level influence contingent on workers' capabilities for voice in a setting where workers have the right, but not the obliga-

tion, to elect representatives to the board of directors? This paper examines if the rights-based scheme falls short when workers are not themselves knowledgeable about BLWR, are less likely listened to in the boardroom, or are less able to participate because of low socio-economic status. Theoretically, the paper analyzes the rights-based BLWR legislative scheme through the lens of a capability for voice as formulated by Bonvin (2012) and tests its empirical implications. Empirically, the paper draws on longitude Danish register data and analyses first-time adoptions of BLWR since early 2000. First, I show that workers' knowledge about BLWR from personal experience in prior employment relations matters for the probability that BLWR is adopted in firms with family boards. Only, however, when taking into account the share of specialists employed in the firm. Based on capabilities for voice theory, I interpret that both political resources (measured as BLWR knowledge) and cogitative resources are particularly important for the first-time adoption of BLWR in firms with family boards. Second, I find that in firms with a high degree of unionization, workers' experience with BLWR matters for the probability that BLWR is adopted for the first time. I interpret, that unions play a moderating role in the first-time adoption of BLWR on firm-level. Insights from the paper are especially relevant to younger and less experienced parts of the workforce as well as cases of family firms and contribute to the growing literature on heterogeneity between BLWR firms.

1.4.2 Worker Representation and Job Quality

Is there any effect of granting workers the right to representation in the board of directors and cooperation committee on job quality? Worker representation is of-

ten promoted as a mechanism to secure better working conditions for workers. Yet, the rarity of such institutional mechanisms and the lack of credible measures of job quality have limited empirical research on the topic. Results from existing empirical research are either incredibly vague or in some cases even contrary to the central expectation, that worker representation resolves in better job quality for workers. In this article, we aim to bring renewed clarity and a stronger claim of causality to the question by implementing a regression discontinuity design exploiting the 35-worker threshold in legislation to estimate the bundled effect of granting workers the right to representation in the board of directors and cooperation committee on job quality. We rely on a comprehensive employer-worker matched data set merged with nationally representative survey data (N=38,000) on workers' job quality.

We arrive at two preliminary results. First, we find that the regulation translates into board-level worker representation (BLWR) only in highly unionized firms. Second, most job quality effects from the right are materialized in firms with a low degree of unionization and are limited to workers' work engagement. We interpret, that while unions are driving the implementation of worker representation in the board of directors, unions evidently are substitutes to BLWR in generating better job quality for workers.

In the article we further emphasize, that no effects are found on most outcomes tested in the empirical analysis including workers' concerns of job loss and involuntary moves, work-life balance, and planning and organization of work. The limited effects are either a result of (i) flawed theoretical reasoning or (ii) ineffective worker representation mechanisms (e.g. because of minority representation or that

shareholder-elected directors largely ignore inputs from worker representatives). Moving forward, we want to estimate the effects of the actual implementation of board-level representation in fuzzy regression discontinuity set-up and further unveil the mechanisms leading to the outcomes tested in the analysis.

1.4.3 Participatory Practices and External Hires to Managerial Positions

Do firms with participatory practices hire more managers internal the firm? In research on firms' managerial hiring strategies, a sizeable firm-level heterogeneity remains unexplained. In this article, we provide both theoretical reasoning and empirical evidence that firms' participatory practices (captured by worker representation on the board of directors) partly explain this firm-level heterogeneity.

We provide an overview of the most relevant theory on internal labor markets and managerial hiring, and inject theory on participatory practices into this contest. From this, we formulate three distinct theoretical arguments all predicting an increased tendency of internal hiring for managerial positions in firms with participatory practices. First, we argue, that strengthened firm-specific human capital advantages of internal candidates, who already are familiar with the norms and cultures in a firm with participatory practices. With workers represented on the board of directors, managers face more multi-faced accountability. Second, participatory practices improve the information flow about internal candidates to those in charge of the hiring. In firms where workers actively have decided to be represented on the board of directors, we anticipate greater participatory involvement of

workers at other levels of the firm also (e.g. in the cooperation committee). Third, participatory practices increase firms' reliance on internal promotions to motivate workers to limit wage inequality for same-level workers.

We test this hypothesis with a two-stage firm fixed effects empirical strategy capturing the time-invariant firm-level effect of firms' participatory practices on a tendency to internal hiring to managerial positions. We think the time-invariant – general equilibrium – relationship is relevant for our hypothesis, as participatory practices are not instantly established but emerge over time. Our empirical model is estimated with employer-worker matched data for the period 2001-2017. We confirm our hypothesis that firms with participatory practices hire more managers internal the firm, and further provide evidence that this relationship is not caused by a weak ability to attract managerial talent in the external labor market.

1.5 Main findings and implications

Now, after having described each of the three articles including key findings, I want in this section to reflect upon these findings and their implications for theory and our understanding of the working of worker representation generally. Though the articles are distinct, I think the implications of findings in some instances are relevant to discuss together.

Workers' right to elect representatives to the board of directors as secured in the Danish Companies Act is for workers in the majority of firms a necessary but not a sufficient condition to secure workers' freedom to implement worker representation on board-level. That is, a number of contingencies remain barriers for work-

ers to implement BLWR. The finding from the article *Workers' Capability for Voice and Board-Level Worker Representation (BLWR) Contingencies*, that individual workers' prior experience and knowledge about BLWR matters for the probability that BLWR is implemented, likely suggests the importance of individual workers' capability to solve coordination problems within firms. That is, workers need to gather support among worker colleagues in order to implement BLWR. This result aligns with the finding from the *Worker Representation and Job Quality* article, that unions are the main driver of BLWR implementations. Both the finding that BLWR implementation hinges on individual workers' experience with BLWR and unions suggest, that workers' actual freedom to implement BLWR hinges on coordinating resources additional to the BLWR rights. But what does this entail for policymakers and unions aiming to strengthen workers' bargaining power in the workplace or perhaps employers who want to encourage worker participation? One way to solve the coordinating problem is to require BLWR elections to be held in firms by default facilitated by incumbent management. From the perspective of unions, the result suggests that there should be more emphasis on information campaigns and perhaps educational programs for firm workers on how to organize support among worker colleagues.

In the article *Participatory Practices and External Hires to Managerial Positions*, we find that firms with participatory practices — that is, firms with worker representation on the board level — hire more managers internally (as opposed to externally) in the firm. If this result was driven by worker representatives informing the board of directors about internal candidates, that is, an information channel, we would expect the effect to be even stronger if we instead of focusing on all managerial

positions focus exclusively on the top-five managerial positions as this group includes the firm CEO who is the only manager hired by the board of directors. Our findings however suggest, that tendency to hire internally the firm in firms with participatory practices firms is the same when we focus on top-five managerial positions as for the wider managerial teams. As internal hiring for top-five managerial positions, here among the firm CEO, is not more likely internal than for the general managerial team, our suggested information channel is somehow undermined in favor of our norms and culture channel. That is, the reason for participatory practicing firms' inclination to hire internally rather than externally the firm has to do with the importance of candidates' personal experience with norms and culture in participatory practicing firms. Firms with participatory practices appear to realize that it requires a distinct set of competencies to manage in this group of firms and that they adjust hiring policies accordingly to hire candidates familiar with norms and cultures in participatory practicing firms.

There is little evidence that BLWR improves the quality of work for workers (except for the finding, that workers' engagement and sense of meaning are slightly improved in low-unionized firms). In the *Worker Representation and Job Quality* article we find little evidence that BLWR improves the quality of work for workers. This result holds not only for outcomes such as wages, wage dispersion, sickness leave, workers separation rates, and similar measures typically registered in firms' HR systems but also for the questionnaire outcomes that we analyze in the article. And as we discuss in the article, this finding is aligned with existing literature with a few exceptions. Reasons for this finding likely include workers' right only to elect a minority fraction of board directors and general equilibrium effects from

BLWR regulation on the general labor market (i.e. that workers' representation in the board of directors and other bodies since the mid-1970s has changed the terms for workers' generally and vanished differences between firms with and without worker representation in the board of directors).

BLWR is not linked to adverse effects on the quality of externally hired managers. One main concern, that we tested in the *Participatory Practices and External Hires to Managerial Positions* article, is if external managerial candidates systematically avoid positions in BLWR firms either because of greater accountability towards workers or because candidates anticipate less wage dispersion, and that candidates hired in BLWR firms on average are less qualified as a result. In the article we find no evidence of sorting of this sort nor do we find, that BLWR firms pay a premium for externally hired managers relative to non-BLWR firms. Combined with the finding that BLWR has almost no effects on workers' wages, separation rates, etc. as concluded in the *Worker Representation and Job Quality* article – that is, no evidence of significant rent-seeking among workers – the economic downside of BLWR from the perspective of shareholders appear nonexistent. A finding perhaps reassuring for American shareholders who might face the introduction of formal worker representation rights in the decades ahead.

1.6 Suggestions for future research

Naturally, contemplating the literature, ideas, and my findings on worker representation for the duration of my Ph.D. has resolved a range of ideas for future research. In this last section of the general introduction, I focus on five of the most

present questions in my mind as I finish up my dissertation.

In the article on *Worker Representation and Job Quality* we find little or no effect of worker representation on job quality. While there may be good reasons that these results do not reflect the counterfactual scenario of no rights for worker representation (e.g. because of general equilibrium effects of all firms), results likely reflects the effectiveness of worker representation is limited e.g. because of its minority representation or that shareholder elected directors largely ignore inputs from worker representatives as discussed in the first article *Workers' Capability for Voice and Board-Level Worker Representation (BLWR) Contingencies*. The results of the *Worker Representation and Job Quality* article leaves the impression, that the effectiveness of worker representation rights as specified in the Danish Companies Act is limited and that political ambitions to secure better working conditions for workers are perhaps better served with alternative initiatives. And further, it suggests revising the theoretical work on worker representation and greater creativity in policy making.

What drives workers themselves to run for election to representation in either the board of directors or the cooperation committee? In the article *Workers' Capability for Voice and Board-Level Worker Representation (BLWR) Contingencies*, I examine the role of workers' capabilities as defined by Bonvin (2012). Still, however, literature is lacking knowledge on the kind of motivations most important to workers elected as representatives. Take for instance board-level worker representation. Whereas board-level worker representatives are compensated the same as shareholder-elected directors, the role comes with several costs at the same time.

This includes the additional workload, potential conflicts with fellow workers not satisfied with what is achieved in the boardroom, responsibility in cases of firm distress, and so on. So what are the main motivations? Career move? Sense of justice? Board fee?

Are unions substitutional or complementary to workers' representation in the board of directors – and more generally, how are the dynamics between various forms of worker representation including the cooperation committees? In the second article on workers' job quality unions are concluded to be substitutional to workers' right to representation in the board of directors. As workers' job quality is only improved from the right in low unionized firms I interpret, that the right only has an impact in the absence of unions. At the same time, I find both in my first and second article, that unions are a key moderator for the implementation of BLWR. Though the two findings are not contrary, it remains puzzling why unions evidently support the implementation of worker representation although my findings suggest no complementary. The question of substitutional and complementary may further be extended to other forms of worker representation e.g. in the corporation committee. Whether substitutional or complementary may among other things hinge on the unions' agendas. In the U.S., for example, unions oppose the expansion of worker ownership and profit sharing as a consequence of unions' focus on securing stable wages for members (Kruse et al., 2010).

Psychological experiences, changed worker and governance practices, or perhaps both? The effects of worker representation on the board of directors or the coordination committee on workers may be manyfold, and the unveiling of these effects

may gain from more mixed discipline approaches. Though I do not rely on theories on the psychology of workers (e.g. Clausen et al. (2022)), the possibility that job quality effects unveiled in the second article are driven by pure psychological effects. For instance, workers may experience a greater degree of autonomy and self-determination Bowie (2017) if represented on the board of directors even though its implementation does not materialize in changed worker practices. Addressing this question may benefit from qualitative methods.

Is worker representation effective for enhancing workers' bargaining power or a mere ideological relic? In the *Worker Representation and Job Quality* article, we generally find little evidence of any effects of workers' right to representation in the board of directors and cooperation committee. And this result is in line with the literature on the subject. Whereas the reason may be, that there simply are very little effects of BLWR across the board (as discussed in the *Worker Representation and Job Quality* article), it too may suggest that research until now has focused on the wrong outcomes. I think a survey study or even qualitative interviews with both worker representatives themselves and unions advocating for worker representation on their objectives will be greatly contributing to the existing literature.

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Chapter 2

Workers' Capability for Voice and Board-Level Worker Representation (BLWR) Contingencies

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Abstract

With board-level worker representation implemented in only 24% of firms subject to legalisation on BLWR rights, I investigate in this paper if the lack of implementation has to do with a lack of capabilities for voice among workers. The limited prior literature on this topic has focused on the role of ownership and the degree of unionization on workers' choice to elect worker representatives on board-level and largely left out the workers' side of the equation. This paper examines if the rights-based scheme falls short when workers are not themselves knowledgeable about BLWR, are less likely listened to in the boardroom, or are less able to participate because of low socio-economic status. I analyse the role of workers' capabilities in a rare event study using administrative employer-worker data from 2003-2017. In the paper, I arrive at two key findings. I find workers' knowledge about BLWR from personal experience in prior employment relations matters for first-time BLWR implementation in (1) firms with family members in the board of directors, and (2) in firms with a high degree of unionization.

2.1 Introduction

Why do workers abstain from electing board-level representatives? Workers' right to elect board-level representatives is secured in Danish corporate law, but in 76 percent of firms subject to the law, workers abstain from exercising this right. Not only is this number significantly higher in emerging industries, it too is growing in the wider economy. Predominantly, prior literature has focused on the workers' economic incentives to elect board-level worker representatives (e.g. transaction costs theory Bryson (2004), Bryson et al. (2003), and Williamson (1973)). This paper aims to explore if workers' capabilities for voice as defined by Bonvin (2012) matter in a jurisdictive context where workers' right (but not obligation) to elect board-level representatives is secured. And it is investigated if workers are free to adopt BLWR.

The paper addresses this question in a number of steps. First, by introducing a new theoretical framework from the context of deliberative democracy theory to the research on BLWR, the paper raises a novel question on the role of workers' capabilities for voice. More specifically, the paper examines if firm-workers abstain from participating in industrial democracy in the form of BLWR because of compromised capabilities. That is, despite the formally secured right, is workers' real opportunity to engage in board work somehow compromised due to a lack of political resources, cognitive resources, and/or the unwillingness of interlocutors to listen? Common for all three mechanisms studied in this paper, is that workers' real freedom somehow is compromised.

Second, the fine-grained and comprehensive nature of the (longitude) employer-

worker data offers high-quality measurement of all three capabilities theoretically proposed. Workers' political resources to adopt BLWR are measured as individual firm workers' experience with BLWR legislation and its functioning. By tracking workers' personal experience with BLWR from prior employment relations, I compute measures both of the scope and quality of knowledge among firm-workers. I measure workers' cognitive resources to gather support for the adoption of BLWR and ultimately engage in board work by firm workers' socio-economic status. Finally, the (un)willingness of interlocutors to listen is measured by the presence of family members on the board of directors, as this matters for worker directors' opportunity to build coalitions. I expect specifically, that the probability that workers executive the right to elect worker directors is lowered in firms where (1) workers' political resources are restricted due to little or low quality of knowledge about BLWR legislation, (2) on average lower socioeconomic status among firm-workers, and (3) greater family members in the boardroom among shareholder elected directors.

Third, it is the first paper implementing a firm fixed-effects model in the context of BLWR research on Danish employer-worker data. By controlling for firm-fixed effects, the analysis concentrates on within-firm variation as time-invariant unobserved firm effects are controlled for. I combine longitude employer-worker matched data from 2001 to 2017 with firm-level managerial data and identify 343 events where BLWR was established for the first time at the firm level. However, due to the limited number of events and to avoid inflated estimates and biased marginal effects (Cook et al., 2020), a penalized maximum likelihood with firm fixed-effects (PML-FE) estimator is implemented.

In this paper, I show that workers' knowledge about BLWR from personal experience in prior employment relations matters for the probability that BLWR is adopted in firms with family boards. Only, however, when taking into account the share of specialists employed in the firm. Based on capabilities for voice theory, I interpret that both political resources (measured as BLWR experience) and cogitative resources are particularly important for the first-time adoption of BLWR in firms with family boards. Second, I find that in firms with a high degree of unionization, workers' experience with BLWR matters for the probability that BLWR is adopted for the first time. I interpret, that unions play a moderating role in the first-time adoption of BLWR on firm-level.

Why should we care about industrial democracy participation in the form of BLWR? Generally, the case of BLWR builds on a range of political, moral, and economic arguments. One concern addressed in political philosophy, as showcased in this paper, is addressing the expansion of democracy from the political to the industrial arena (e.g. Sen (1980) and Bonvin (2012)). Strengthening industrial democracy participation simply is an end in itself. The moral case of democratic participation perceives it as intrinsically valuable to the individual worker as it enhances opportunities for self-determination according to certain moral traditions (Sen, 1999b). Thus, participation in industrial democracy may be considered part of a good life and human flourishing and a valuable functioning in itself. The economic argument relates to the belief that participation will improve productivity and industrial relations (e.g. Hansman's theory on incomplete contracts (Hansmann, 1988)[1] or resource dependency theory (Hillman et al., 2009)). This paper

[1] According to (Hansmann, 1988), firms should aim to internalize stakeholders that are the most

is multi-disciplinary in the sense that it combines political philosophical and economics theories and reasoning.

This paper makes three main contributions to the academic literature and the discussion about BLWR legislation (e.g. Conchon (2011), Belloc (2015), and Kraft and Fitzroy (2005)). First, it contributes to the literature on the dynamics of rights-based (voluntary) BLWR. Gregorič and Poulsen (2020) find, in a Danish context, that the percentage of firms with instituted BLWR is statistically even more seldom in firms with family-related members or CEO on the board of directors. Gregorič and Poulsen (2020) explain this later result with strong and grounded family values insensitive to workers' aspirations and participation. In the same paper, it is found, that the adoption of BLWR is positively associated with the firm-specific human capital and firm-tenure of workers. In both cases, workers have more residual rights because more invested in the firm, it is argued.

A very few studies have been published on the very initial establishment of BLWR. In fact, the only paper comparable is by Mohrenweiser et al. (2012) on events triggering the establishment of works councils in a German context. The paper finds that out of all first-time implementations of works councils, one-third of all cases are related to changes among executive management and that the probability is higher in cases of MA activities. Because the Mohrenweiser et al. (2012) study is based on cross-sectional data, it was not possible to unveil any timing dynamics of trigger events. Drawing on longitude worker-employer linked data this study likewise aims to contribute with a more in-depth understanding of the timing dimension of events triggering the institution of BLWR.

complicated to contract.

As for this paper, Berglund and Holmén (2016) also examined workers' choice not to nominate and elect board-level worker directors in a Swedish setting comparable to the legislative setting of this paper. Focusing on the costs and risks carried by the individual worker director, Berglund and Holmén (2016) conclude that workers' aversion towards the responsibilities of directorship. For instance, workers are less likely to elect BLWR in cases of more firm risk measured by the firm's stock market volatility according to this study.

Another stream of literature examines BLWR in times of economic recession (**?**, Kraft and Lang (2008), and Jirjahn and Smith (2006)). In a German context, Jirjahn (2009) find that works councils are more likely established in periods of poor economic conditions. A result that supports the idea that BLWR is not introduced as a means of worker rent-seeking (at least not exclusively) but as a safeguard in changeling times. No prior papers have examined the role of workers' BLWR knowledge shortage or socioeconomic status making room for novel contributions from this paper.

Second, the paper informs the jurisdictive process on how workers' representation on the board of directors should be legislated as well as the role of unions. While BLWR is mandatory in counties like Germany and Norway, other counties (e.g. France) have a legislative setting similar to the one in Denmark. From a policy-making perspective, one may lever the insights from this paper to consider if shareholder-elected directors should have the responsibility of informing workers about their BLWR rights or even default to arrange elections to overcome the knowledge barrier. In addition, the paper reminds us about the heterogeneity of the functioning of BLWR. While workers' formally secured right to elect board-

level representatives is the same, workers' real opportunity to impact board-level decisions evidently varies with interlocutors' readiness to listen. Interlocutors' readiness to listen and opportunities for coalition building as a minority in the board of directors simply are more challenged in cases of family- and concentrated ownership generally.

Third, the paper adds to our understanding of capacities for voice and their importance for workers' participation in industrial democracy in the form of BLWR. The more general idea of capabilities in the context of democracy dates back to Sen (e.g. Sen (1980)) and even earlier political theorists, but has been discussed more recently by scholars like Bohman (1996), Bonvin (2006), Dean et al. (2005), and Gilbert et al. (2019). None of which relates specifically to industrial democracy in the form of BLWR however.

The rest of this paper is organized as follows. In section 2, I present the capability for voice theoretical framework of the paper. In section 3, I describe the institutional context and discuss how it compares to legislation in the greater European area before moving on to an overview of empirical patterns of the prevalence of BLWR as well as general descriptive statistics in section 4. In Section 5, I describe the empirical strategies implemented to evaluate the determinants of the first-time introduction of BLWR at the firm level as well as the results of the analysis. In section 6, I examine unionization as a moderating factor for workers' capability for voice before addressing alternative explanations in section 7. Finally, section 8 discusses workers' real freedom to reach for board-level influence and concludes.

2.2 Capability for voice and BLWR contingencies

Even in a jurisdictive context where workers' right to elect board-level representatives is secured, workers' real freedom to participate in industrial democracy in the form of BLWR remains contingent on capabilities as defined by capability approach theory. This is the central claim of the theoretical framework developed in this section. Drawing on capability approach theory as defined in the context of workers' voice by Bonvin (2012), I here theorize how the availability of political resources, cognitive resources, and the readiness of interlocutors to listen are all capabilities important for workers' real freedom to adopt BLWR. To unfold the argument, first I introduce the general framework of capability approach theory before defining each of the three capacities in the context of BLWR. The discussion is followed by some considerations about the assumptions made before the empirical implications are derived towards the end.

Capability approach theory originally was formulated and pioneered by Sen(1974, 1979, 1980, 1995, and 1999a) as a critique of prevailing economic models and accounts of evaluations (e.g. utilitarianism). Sen thought that a notion of what each of us actually can be and the kind of activities we actually can do were missing. And as a result, he introduced the idea of capabilities (also known as capability approach theory). That is, persons' real freedom to achieve their potential beings and doings. In contrast to the formal freedom to be or do something, real freedom refers to the state where all means necessary to be or do something are available to a sufficient extent. With the notion of capabilities, Sen suggests a change of focus from means (resources and goods available), to ends (the kind of actions people

are able to take on with those resources and goods). The real freedom of two different people to achieve something with the same resources and formal freedom may vary substantially with circumstances, Sen argues. And this is exactly the idea that Bonvin (2012) builds on[2] when formulating the notion of capability for voice in the context of workers' voice.

In his paper, Bonvin (2012) draws on the notion of capability for voice from Bohman (1996) and Bohman and Rehg (1997). Bonvin (2012) is concerned with the extent to which workers can express their wishes, concerns, and expectations in firm decision-making processes and how this may be designated and understood. Generally, Bonvin formulates his view on workers' capabilities as follows "The capability approach requires that all people be adequately equipped to escape from the constraint of valueless work, either through the real possibility to refuse such a job (at an affordable cost, i.e. with a valuable alternative, be it adequate financial compensation or another job), or through the possibility to transform it into something one 'has reason to value'." (Bonvin, 2012). Bonvin's notion of capability for voice does not imply or suggest the disappearance of all constraints, but it advocates for what he calls a "fair" negotiation of terms of work between workers and employers. And it that sense it is not compatible with a top-down understanding of governance (or a "command and control" model, as he formulates it).

In a rights-based BLWR legislative setting, the legislation removes a restraint for workers to elect board-level representatives. Workers simply have the right to elect board-level representatives with the same voting rights and responsibilities as fel-

[2]But also draws on Hirschman (1970) and Supiot et al. (2001) among others in order to formulate a capability approach theory in the context of employment relations.

low shareholder-elected directors. And according to the thinking of Sen (1974) and Bonvin (2012) among others on capabilities and freedom, this legislation very much represents formal freedom for workers to voice their point of view in the boardroom. This formal freedom arguably falls short if workers are not in a position to reach for it, that is, if workers do not possess the capabilities for voice as defined by Bonvin's (2012) version of the capability approach theory. In the following paragraphs, I elaborate in more depth how Bonvin (2012) defines each of the identified capabilities for voice (i.e. political resources, cognitive resources, and the readiness of interlocutors to listen) in his theoretical framework and how I interpret and measure each of them in the context of BLWR.

By the availability of political resources, Bonvin (2012) refers to the capability of workers to organize, build collisions, and mobilize means to weigh in on firm decision-making processes. Bonvin (2012) also discusses the importance of recognition of workers as well as unions' legitimacy in firm decision-making processes. I argue, that workers' knowledge about the jurisdictions in the context of BLWR can be considered one such political resource according to the definition of Bonvin (2012). If workers are not familiar with the legislation, functioning, or opportunities of BLWR, workers are not in a position to actually exercise (or not to exercise) this very right. That is, workers do not possess the capability key to organize and mobilize means to weigh in on firm decision-making processes in the boardroom. Workers' knowledge about BLWR may originate from a number of sources including union campaigns, business education, and professional networks. In this paper, I measure workers' knowledge about BLWR by tracking personal experience in prior employment relations. By dividing workers into groups with respectively

personal and no personal experience with BLWR from prior employment relations, a group of workers on average more knowledgeable about BLWR by assumption is encircled. Because knowledge about BLWR may originate from a number of sources, one needs to assume sourcing of some kind does not make the group of workers with no personal BLWR experience in fact more knowledgeable about BLWR. Because a fraction of workers with no knowledge about BLWR would have decided to reach for board-level influence had they had the knowledge, the group of workers with personal BLWR experience is on average expected more often to exercise their right to elect worker directors in comparison.

Workers' cognitive resources are defined by Bonvin (2012) as the ability to argue and communicate, to access and process information, and negation skills. Bonvin (2012) for instance argues, that relying only on financial information contours a very reductionist picture of the firm. Workers and their board-level representatives need to have the capability to produce their own descriptions and information to voice their points of view. To measure workers' cognitive resources, I propose traditional measures of workers' socio-economic status; employment position, and human capital (level of education). The socio-economic status will to a certain extent determine the kind of real freedom the individual worker, as well as the firm-workers as a group, have to maneuver in the context of BLWR.

Bonvin (2012) mostly refer to shareholders and executives when discussing the readiness of interlocutors to listen, but in the context of BLWR, this also should include shareholder-elected non-executive directors. Bonvin argues that the readiness of interlocutors to listen is not only about sensitively towards workers' concerns and goodwill, but also the legal and institutional setting as well as the du-

ties of shareholders, executives, and non-executive directors. I propose ownership concentration and the occurrence of family ownership to measure the readiness of interlocutors to listen. Because workers in the legislative context of this paper have the right to elect a minority of 1/3 of non-executive directors, worker directors have fewer opportunities to form coalitions in the boardroom when shareholder-elected directors represent only one (or a very few) shareholders. As for family firms, family traditions and values are stronger and ownership concentration is higher. And as a result, worker directors are less likely to be listened to Gregorič and Poulsen (2020). This paper focuses on the probability that workers exercise their right and reach for board-level influence and not the kind of worker influence actually realized. Only workers' freedom to reach for board-level influence has been considered in this paper. Not the kind of actual or potential influence accessible to workers. And this is very much aligned with the theoretical considerations of Bonvin (2012). The corporate law-text reads, that the BLWR legislation is securing the influence of workers. It is not specified, however, exactly what is meant by influence. It should be emphasized that what is addressed in this theoretical framework is the freedom of individual workers by participation to form support for worker director elections. The democratic nature of BLWR is not questioned. That is, it is not about the individual worker's freedom to reach for board-level influence in her own right regardless of the 'general will' of all firm workers. To understand the freedom of the individual in a democratic construct, it probably is worth looking toward Rousseau's account in his theory of freedom in democratic societies. According to Rousseau, participation of the individual in the community frees the individual because leveraged into a collective exertion of

control in accordance with a 'general will'. BLWR makes workers freer because of a higher degree of collective self-determination. And the freedom of the individual worker is then again determined by the extent to which she or he participates in the democratic process of electing worker directors (Carter (2019)). In this theoretical framework, workers are assumed to be rational. Workers are assumed to make a rational choice of engaging in the worker democracy conditioned on the capabilities for voice discussed here.

Legislation securing workers' right to elect board-level representatives is very much reflective of a focus on formal freedom. And at the same time a precondition for workers' real freedom to reach for board-level influence. But what happens if we focus exclusively on securing workers' formal freedom in the case of BLWR? What happens if we do not pay attention to workers' real freedom to reach for board-level influence? According to the line of thinking proposed here, the opportunities of BLWR will only be available to workers with capabilities for voice. That is, workers who are informed about the jurisdictive context of BLWR, who possesses the abilities to organize, and who happen to be employed in a firm where incumbent management and shareholder-elected directors listen. And for the first two categories of capabilities, this may likely disproportionally be the case for less resourceful workers or workers with little labor market experience. The paper does not address if compensating or providing workers with the capabilities for voice discussed here is a responsibility for instance of authorities, incumbent non-executive directors, firm executives, or shareholders. The purpose of the paper is to expose the consequence of workers' lack of capabilities and thus real freedom to reach for board-level worker representation is neglected.

I finally I want to stress, as also discussed in the introduction, that board-level worker representation is not desirable for all workers and it is not an inevitable corporate governance mechanism. For a number of reasons, even workers possessing all capabilities discussed here may believe board-level representation is not for them. Perhaps because workers are satisfied with incumbent directors' approach to workers' work conditions or because employment spells are too short for any worker to feel the urge to engage. Real freedom to reach for board-level worker representation is of course also the choice not to reach for board-level influence. The point is that workers' choices in such cases are freer. and Gilbert et al. (2019). None of which relates specifically to industrial democracy in the form of BLWR, however.

2.3 Institutional context

The analysis takes place in a legal context where only workers in limited liability and joint stock firms with at least 35 workers on average in the prior three consecutive years have the formal right (but not the obligation) to elect board-level worker representatives. The right to nominate and elect worker directors has to be requested by at least 10 percent of workers in the firm, by a majority of corporation committee members, or by a union if representing at least 10 percent of the workers. Workers have the right to elect a maximum of half the number of non-executive directors in the existing board of directors (rounding up if the number is uneven) resolving in a minority of one-third of all sets in the board. Further, the legislation also allows workers to elect representatives for the group board of

directors.

Worker directors have the same rights, duties, and responsibilities as other members of the board of directors. This includes all directors' duty of loyalty to act in the interest of the firm. The aim of BLWR is to take on the non-executive directors' role from a worker perspective, not for workers to do union work on the board of directors. If the right to board-level worker representation is requested, the board of directors has the legal obligation to covey information about firm financial performance and other firm performance measures to all workers (Conchon (2011)). No legal direction on how to involve the elected worker directors in board work is defined. Election periods are four years and newly elected worker directors join the board shortly after the company's ordinary annual general meeting and thus simultaneously with directors elected by shareholders at the annual general meeting. Unlike worker directors, shareholder-elected directors typically are not elected for a fixed number of years. As this paper models trigger events for the implementation of BLWR, this timing information is of course key. Since BLWR legislation in Denmark was introduced for the first time in 1974, only a few modifications of paragraphs have been made (E&S (2014)). In 2010, however, some actions were taken to loosen up workers' access to the boardroom.

When the Danish corporate law on board-level worker representation was first introduced in 1974 (E&S (2014)), BLWR was instituted in the majority of limited liability firms. And given the more widespread nature of BLWR in the late seventies, one could speculate if the norm to adopt BLWR was stronger back then. Today, fifty years later, BLWR is instituted in a minority of 24 percent of firms subject to

the legislation. Why is this? workers still have the same right to elect worker representatives to the board of directors. In fact, some legislative actions were taken in 2010 to loosen up workers' access to the boardroom. This paper hypothesizes that a lack of knowledge about BLWR rights and opportunities partly explains workers' reluctance (find a better word) to execute their right to elect board-level representatives.

Strong unions, tree party negotiations, flexicurity, and the social state too is relevant taking into account considering BLWR in a Danish legal context. A number of benefits are secured by the state and thus outside the worker-employer relation. This includes health care and basic parental leave schemes among other rights. In addition to BLWR, co-determination in the Danish legal context also takes the form of collaboration committees (SU) as well as union representatives. For every fifty workers, workers have the right to elect an additional member of the collaboration committee.

Within the European economic area, legislation on workers' rights to BLWR varies between national states. Whereas no rights are secured in countries like Italy and Belgium, BLWR rights are exclusively secured for workers in the public sector in countries like Spain and Greece. In countries like France and Denmark, workers are secured the opportunity to BLWR. Only in a few counties like Germany and Norway, BLWR is required in larger firms (Conchon (2011)). Whether BLWR legislation is embedded in either corporate law (e.g. Denmark and Germany) or labor law (e.g. Austria) too reviles national ideological attitudes as the legal status of the right to BLWR is conditioned on this dissimilarity. When embedded in labor law, BLWR is considered a fundamental employment social right as opposed to a

subject for economic deliberations when embedded in corporate law (Munkholm (2018)). This paper problematizes if the BLWR legislative schemes that formally secure workers the opportunity to elect board-level representatives by asking if securing optionality for workers to elect directors also is to secure genuine co-determination. Legislators may want to reconsider whether the intention of the BLWR legislation is in accordance with the in-practice mechanics analyses in this paper.

2.4 Data and empirical patterns

In this section, I describe the basic structure and sources of data and present stylized facts on respectively the rareness of events, unobserved firm-level heterogeneity, and non-orthogonality of predictors and firm effects. All three are important for the choice of empirical strategy that I describe in the subsequent section 5.

2.4.1 Sample construction

Data on firms' governance characteristics are sourced from the Danish Business Authorities (Erhvervs- og selskabsstyreslen) and cover both shareholder and worker-elected non-executive directors as well as executive management since the mid-eighties. For non-executive directors, both information on the election form (shareholder or worker elected) as well as position on the board (chair- and vice-chairpersons) is available. To minimize registration errors, I in addition require worker directors to be registered as firm-workers in the IDA registers. Except for foreign individuals, all observations are registered with both a firm id (CVR-numbers) as well

as a personal id (CPR-numbers). Firms are required by law to report changes of board directors and executive management within two wakes after the change was made. All positions are registered as spells with known starting and ending dates.

In addition, I retrieve a range of person-level information from the Danish Civil Registration System on level of education as well as family ties for board directors using CPR-numbers on spouses, children, and siblings. Also, I rely on worker-employer data (IDA datasets) to compute individual workers' occupation codes, firm tenure, and union membership. Again, the different data are linked by person-level id's (CPR-numbers). I rely on the General Firm Statistics registers (FIRM and FIRE) provided by Statistics Denmark for firm financial information. The registers cover information on financial statements (balance sheet and income statements) as well as other firm-level information like the number of workers and sector. Firm financial information is linked to the remaining data using CVR-numbers. In addition, I add information on ownership stakes using data collected and provided by a private firm (Experian) to compute measures of ownership concentration.

The analysis includes both listed and non-listed joint stock firms in Denmark from 2001-2017. A number of selection criteria have been imposed, however. The sample is restricted to firms subject to board-level worker representation (with at least 35 workers[3] in three consecutive years prior to the focal year of the analysis). Joint stock firms ought to have a board of directors, but in order to deal with potential registration errors, data also is restricted to firms with a board of directors registered prior to the first-time election of worker directors. Because the analysis focuses on the first-time board-level worker representation is implemented at the

[3]Legislation on BLWR is explained in more detail in Section 2.3 on the institutional context.

firm level, data also is restricted to firms with either no worker directors or firms with worker directors elected for the first time that very year. This final restriction reduces the sample to 3.200 firm-year observations (around 220 unique firms each year). As a robustness check, cases of firms engaging in mergers and acquisitions activities are excluded in selected models.

2.4.2 Variables

Dependent variable Relying on a Danish Business Authority's panel data for non-executive directors, cases of at least one newly elected board-level worker representative to a board of directors with no worker directors registered the previous year. This definition does not take into account the total number of worker directors in a given board of directors. In the period covered from 2001 until 2017, 343 cases[4] of first-time BLWR adoption are identified (*BLWR adopted*). In the base model, the control group consists of firms without BLWR where no workers are elected between two years. Also, cases of group board-level worker representation are excluded even in cases of no BLWR in daughter companies. By excluding co-determination on the group level, the control group becomes more homogenous.

Explanatory variables In this paper, I measure workers' knowledge about BLWR as an indicator for workers' political resources by tracking personal experience in prior employment relations. By dividing workers into groups with respectively

[4]Requiring two (three) consecutive years of no board-level worker directors registered prior to the identified first-time elected worker directors on firm-level reduces the number of unique cases from 410 to 385 (343).

personal and no personal experience with BLWR from prior employment relations, a group of workers on average more knowledgeable about BLWR by assumption is encircled. And I compute two different measure types. The first type measures workers who themselves have been elected as a worker director in a prior employment relation (*first-hand BLWR experience*). The second type measures workers who were employed in a firm with BLWR adopted prior to their current employment relation (*second-hand BLWR experience*). Workers with the kind of first-hand experience with BLWR tracked in the first measure are considered more knowledgeable on average than workers with the second type of experience. Because knowledge about BLWR may originate from a number of sources, one needs to assume sourcing of some kind does not make the group of workers with no personal BLWR experience in fact more knowledgeable about BLWR. Because a fraction of workers with no knowledge about BLWR would have decided to reach for board-level influence had they had the knowledge, the group of workers with personal BLWR experience is on average expected more often to exercise their right to elect worker directors in comparison. In order to measure workers' cognitive abilities, I compute explanatory variables indicating the *average human capital* of firm-workers as well as the *share of specialists* and *share of blue-color workers* among the total number of firm-workers. While workers' *human capital* is measured as the number of years of completed formal education after primary school, workers working as specialists and blue-color workers are identified by relying on IDA data for job positions. Finally, I measure the readiness of interlocutors to listen by the presence of family members among shareholder-elected directors (family-related board). This is a board composition dummy variable indicator of family ties within the board of

directors. The variable takes into account parents, children, partners, and siblings. In addition to the trigger events of primary interest for this study, trigger determinants identified in previous studies too are included. Organizational chocks in general and owner changes, in particular, are considered important for the establishment of works councils (Mohrenweiser et al. (2012)). And for this reason, acquisition events are controlled for in the model specification whereas cases of mergers and firms acquired are removed from the sample. Mergers and acquisitions cause generally speaking many simultaneous organizational changes and for this reason they are either controlled for (in cases of acquiring firms) or completely removed from the sample in cases of acquired firms and mergers. *Acquisitions* are registered if the firm has since the previous year (year -1) taken over another firm. Both events of mergers and acquisitions are computed based on longitude data by tracking worker-employer relations cross time and firm-ids.

Co-variances Other variables potentially determining the implementation of BLWR are included in addition as controls (Mohrenweiser et al. (2012)). Firm size (*number of workers*) is positively associated with the workers' election of board-level worker directors; a greater need for mitigating transaction costs in more complex hieratical organizations is suggested as a primary reason for this association (Mohrenweiser et al., 2012). The proportions of different types of workers employed in the firm (*share of specialists* and *share of blue-color workers*) are controlled also for, as this BLWR systematically is more widespread in firms with more skilled workers employed. Largely, the literature interprets that job loss is more costly to skilled than unskilled and part-time workers as more firm-specific human capital investments

are at stake (Gregorič and Poulsen, 2020).

In the regression specification also a number of firm financial as well as governance variables are included. Starting with the financial control variables, leverage is defined as total long and short-term debt to total assets as a percentage. *ROA* is included as a measure of financial performance defined as EBIT (earnings before interest and taxes) standardized by total assets in percentages. In the specification, *ROA* one-year prior is included in order to control for economic incentives for workers to nominate and elect board-level worker directors. Aligned with literature, the governance characteristics controlled for include *board size* measured as the total number of both shareholder and worker-elected non-executive directors. An indicator of family boards measured is included (*family-related board*), as BLWR in previous papers is statistically more seldom in owner-managed as well as family firms (Gregorič and Poulsen, 2020). If an executive manager is also holding ultimately the controlling capital stake, the firm is registered as owner-managed. In addition to controlling for owner-managed firms, the number of ultimate owners is also controlled for. Evidently, BLWR and ownership concentration is inversely related (Gregorič and Poulsen, 2020). An indicator for firms linked in a corporate group as either a mother or daughter firm is also included. A complete list of variable definitions is presented in Table 2.7.

In Table 2.1, descriptive sample statistics are reported for the variables selected. As already mentioned, the sample is restricted only to include larger[5] joint stock firms with either no BLWR or BLWR instituted that respective year.

– Insert Table 2.1 here –

[5]With at least 35 workers on average in three consecutive years prior.

2.4.3 Stylized facts

Fact 1: BLWR is in decline In order to get an idea of the scope of BLWR in the labor market of Denmark, some aggregated descriptive statistics are presented. The following Figure 2.1 presents descriptive statistics on the proportion of joint stock firms subject to the law that have worker directors in the boardroom from early 2000 till 2017. Evidently, workers are represented in fewer and fewer limited liability boards compared to early 2000. Whereas BLWR was adopted in 80 percent of limit liability firms with more than 250 workers in 2001, the same percentage was 56 in 2017.

– Insert Figure 2.1 here –

These trends are primarily driven by a reluctance to implement BLWR in new firms, something that applies in particular in emerging industries, as well as firms with BLWR that dissolves. I observe only very limited cases of BLWR dismantles in firms with continued operations (Figure 2.1). The number of workers in limited liability firms larger than 35 workers, that is, workers of firms subject to the BLWR legislation, has been rising since the great financial crisis of 08/09 (Figure 2.2). The rise, however, has been slightly larger in non-BLWR firms.

– Insert Figure 2.2 here –

Fact 2: Implementation of BLWR is rare First-time adoptions of BLWR are rare, and as a result, only a small number of firms in the sample experience the event during the observed period. In Figure 2.3 I present the number of cases with BLWR implemented and dismantled in limited liability firms subject to the legislation on

board-level worker representation. In order to have a more clean measure, I have included only cases of BLWR adoption in existing firms while BLWR dismantles are only registered in firms that continue operations in the years after.

– Insert Figure 2.3 here –

Cases of BLWR dismantles are even more rare than the number of first-time implementations. This is another take-away from the numbers graphed in the same Figure 2.3. In around 20 firms each year with continued operations in the period from 2001-2017, BLWR is dismantled. This not only tells us that BLWR dismantles are rare, but that BLWR is relatively stable after being adopted on the firm level in the first place.

Fact 3: Unobserved firm-level heterogeneity The significant differences in means reported in Table 2.1 illustrate the heterogeneity of non-BLWR firms and firms adopting BLWR for the first time at the firm level. This, of course, suggests that the two groups differ along other dimensions not observed and controlled for in this analysis (i.e. unobserved firm-level heterogeneity). And for this very reason, this paper employs a firm-fixed estimator as described in more detail in section 5.1 on the empirical strategy.

Fact 4: Non-orthogonality of predictors and firm-effects Factors like owner-identity (e.g. family ownership) have been shown to be closely related to the adoption of BLWR (Gregorič and Poulsen (2020)) and so have changes among executive managers (Mohrenweiser et al. (2012)). These associations are likely a result of a number of largely unobserved firm-fixed effects. For instance, Gregorič

and Poulsen (2020) interpreted, that family values and attitudes towards worker participation and the well-being of workers mattered for the adoption of BLWR. While data to some extent allows me to control for these correlations, one has to expect that a considerable degree of firm-level heterogeneity remains unobserved. That is, a great deal of unobserved heterogeneity correlates with co-variances like owner-identity.

2.5 Effect on the probability of first-time adoption of BLWR

In this section, I present the identification strategy and results for the effect of workers' experience with BLWR from prior employment relations on the probability of first-time establishment of BLWR at the firm level.

2.5.1 Empirical strategy

Based on the stylized facts on (2) establishment of BLWR is rare, (3) unobserved firm-level heterogeneity, and (4) non-orthogonality of predictors and firm-effects, a penalized maximum likelihood fixed effects estimator is proposed as the preferred choice. Estimation strategies for rare-event binary time-series cross-sectional (re-BTSCS) data, such as the data analyzed in this paper, is often discussed in literature (Bell and Jones (2015), Clark and Linzer (2015), and Cook et al. (2020)). First, unobserved firm-level heterogeneity is considered inevitable and suggests that a firm fixed-effects estimator is preferred to both pooling and random effects estimators. While pooling assumes no unobserved firm heterogeneity, relying on ran-

dom effects assumes any firm heterogeneity to be orthogonal to the explanatory co-variances. Both assumptions are violated in the empirical setup of this paper. Deciding on a fixed effects estimator is not trivial, however. Because of the incidental parameters problem[6] and the problem that many firms do not experience the event in limited samples, challenges remain. Also, the choice of a firm fixed-effects design imposes the restriction, that only co-variances that vary in time within each firm can enter the model. Each firm becomes its control group (Beck, 2018).

This brings me to the second part of the discussion on re-BTSCS data estimation strategies. In firms that do not experience an event, there is no overlap between the fixed effects and the outcome and these observations do not enter the log-likelihood as a consequence. And for this reason, estimates are only based on firms experiencing an event. This sample selection issue arguably does not cause biased or inefficient estimates, but inaccurate average estimates that are inflated because no-event firms have a lower event probability than event-experiencing firms on average. This in turn biases any marginal estimates one may compute (Beck and Katz (2001), and Cook et al. (2020)). As these considerations narrow down the choice to a biased random effects estimator when covariance and firm effects are non-zero and sample selection induced biased marginal effects to form fixed effects estimation, instead a penalized maximum likelihood fixed effects estimator (PLM-FE), first proposed by Cook et al. (2020), is chosen as the preferred estimator. Because PLM-FE includes firm-fixed effects and at the same time retains firms not experiencing an event during the period covered. Theoretically, this estimator assumes that all firms in the sample would experience an event in time and with enough

[6]Discussed by Heckman (1981), Lancaster (2000), and others.

measure. By modifying the score function, the estimator penalizes the fixed effect related to no-event firms away from negative infinity. And thereby firms that do not experience an event are kept in the log likelihood. The penalized maximum likelihood fixed effects estimator has proven superior to pooled, random effects, and unconditional fixed effects in computing marginal effects when co-variances are non-orthogonality to firm-effects (Cook et al. (2020)).

Because first-time adoption of BLWR is a rare event, the limitations in prior studies have prevented the study of BLWR changes and as a result, hindered the inclusion of firm fixed-effects. In this paper, changes in BLWR on board-level have been tracked in a longitude dataset since early 2000. As suggested by the significant mean differences of non-BLWR firms respectively firms with newly instituted BLWR in Table 2.1, it is desirable to correct for omitted variable bias due to unobserved heterogeneity that is constant over time. This is captured by the firm-specific effect μ_i. Baseline estimation takes the form:

$$\begin{aligned} y_{it} = \alpha + \gamma_1 \textit{First-hand BLWR experience}_{it} + \gamma_2 \textit{Second-hand BLWR experience}_{it} \\ + \gamma_3 \textit{Family board}_{it} + \gamma_4 SOS_i t + \gamma_5 SOB_{it} + \gamma_6 HC_{it} + \beta \chi_{it} + \phi_{it} + \mu_i + \epsilon_{it} \end{aligned} \tag{2.1}$$

y_{it} is an indicator variable taking the value one when board-level worker representation is adopted at firm i for the first time. *First-hand BLWR experience* and *Second-hand BLWR experience* measures workers' knowledge about BLWR. *First-hand BLWR experience* measures the share of full-time firm-workers who have themselves been elected as worker directors in prior employment relations, *Second-hand*

BLWR experience measures the share of full-time firm workers who have been employed in a BLWR firm prior to the current employment relation. *Family board* indicates the presence of family ties among shareholder-elected directors whereas SOS_{it} and SOB_{it} measure the share of specialist and blue-color workers respectively. HC_{it} measures the average level of human capital among all full-time firm workers. X_{it} is a vector of control variables, ϕ_{it} is sector-year and region-year effects, μ_i is firm fixed-effects.

2.5.2 Results

I first estimate the baseline model (2.1) using a probit estimator (see Table 2.2) as this is the preferred estimator in comparable studies like Gregorič and Poulsen (2020). Despite firms with family boards, workers' experience with BLWR from prior employment relations enters significant in all specifications (1)-(4). Consistently with the findings of Gregorič and Poulsen (2020) estimating determinants of BLWR, BLWR is more likely adopted in firms with a higher level of human capital among workers on average and in firms with a larger board of directors. Consistent with the same study is the positive association with union density and inverse association with family boards. Somewhat puzzling, and in contradiction to the Gregorič and Poulsen (2020) study, workers' firm-tenure is negatively associated with the probability of implementing BLWR in the first place.

– Insert Table 2.2 here –

Most of these results change drastically once the penalized maximum likelihood estimator with firm-fixed effects (PML-FE) is estimated in the model specifications

of Table 2.3-(7). While the inverse association with family boards as well as a positive association with degree of unionization and board size remains, now neither workers' prior personal experience with BLWR nor the average level of human capital enters significantly in the very same model specifications of Table 2.3.

– Insert Table 2.3 here –

It is interpreted, that the estimated effects of Table 2.2 not controlling for firm fixed-effects really are symptomatic of some unobserved time-invariant firm-level characteristics. In the case of workers' prior experience with BLWR, one such characteristic could be firms' hiring strategy. In order to test the potential synergy effects of the various worker capability tested in this paper, a number of alternative model specifications are examined with the extension of interaction effects in Table 2.4 and 2.5. In Table 2.4 (2.5) it is tested if workers' political resources taking the form of workers' personal experience with BLWR is contingent on cognitive resources measured as workers' position (average human capital) within the firm. Two results stand out from these model specifications. First, the share of workers with personal BLWR experience seemingly is positively associated with the probability of first-time BLWR adoption, when interacting with the share of blue-color workers (see Table 2.4, specifications (1) and (2)). Seemingly, this association is not related to the presence of family members on the board of directors according to specifications (4) and (5) in the same Table 2.4.

– Insert Table 2.4 and 2.5 here –

Second, workers' personal experience with BLWR is positively associated with the adoption of BLWR in firms with family boards when interacting with the share

of firm specialists. And these results hold both measures of workers' personal BLWR experience (i.e. the share of workers who have been elected worker directors as well as being employed in a firm with BLWR). BLWR is rarely adopted in firms with family boards, and this potentially has to do with strong and overarching family values combined with higher degrees of influence consolidation. For this reason, I interpret both political resources measured as BLWR experience and knowledge as well as cogitative resources are particularly important for the first-time adoption of BLWR in firms with family boards.

2.6 Unionization as a moderating factor

As discussed in the prior section, once controlling for firm fixed-effects, workers' knowledge of BLWR from prior employment relations largely turns insignificant explaining the first-time adoption of BLWR. This result, however, is challenged in this section, where the role of unions as a potential moderating factor is examined. This extended analysis is motivated by two circumstances. First, unions may function as a political capability in the workplace, because they may inform workers about their right to elect board-level representatives and organize support among firm workers. Second, unions have a formal right[7] to request BLWR elections in individual firms if at least 10 percent of firm-workers are members of a particular union. Empirically, I interact the share of firm-workers with respectively first- and second-hand BLWR experience from prior employment relations with a

[7]Unions' right to request BLWR elections on behalf of workers is described in more detail in section 3 on the institutional context.

dummy indicating if there is a high degree of unionization among firm-workers[8]. The model is modified as follows:

$$
\begin{aligned}
y_{it} = \alpha &+ \gamma_1 \textit{First-hand BLWR experience}_{it} + \gamma_2 \textit{Second-hand BLWR experience}_{it} \\
&+ \gamma_3 \textit{First-hand BLWR experience} \times \textit{Strong unions}_{it} \\
&+ \gamma_4 \textit{Second-hand BLWR experience} \times \textit{Strong unions}_{it} + \gamma_5 \textit{Strong unions}_{it} \\
&+ \beta \chi_{it} + \phi_{it} + \mu_i + \epsilon_{it}
\end{aligned}
\tag{2.2}
$$

In firms with a high degree of unionization, workers' experience with BLWR matters for the probability that BLWR is adopted for the first time in the firm they are currently employed.

– Insert Table 2.6 here –

Interestingly, the significant effect of having a high degree of unionization among firm-workers (see model specifications of Table 2.2-2.5) disappears in the specification of this additional analysis (see Table 2.6). This suggests, that unions' role in adopting BLWR for the first time at the firm level is moderating. That is, unions only play a role if workers are more knowledgeable about board-level representation from personal experience in the first place. If workers or unions are more likely to request the right of firm-workers to elect board-level representatives remains unanswered in this analysis. But what remains, is that requesting the right,

[8]If the share of total firm-workers who are members of a union is above sample median, they are categorized as firms with a high degree of unionization.

and ultimately that worker directors successfully are elected, likely is a joined effort between unions and firm-workers.

At the same time, however, it also is clear that unions only successfully function as a moderating factor in firms smaller than 250 workers and in firms with no family ties among board members. As for family boards, it is interpreted, that strong family values remain too overreaching for worker directors to challenge.

2.7 Robustness and alternative explanations

2.7.1 Workers' residual rights and firm-specific human capital

In the paper by Gregorič and Poulsen (2020) it is argued, that BLWR is more prevalent in firms where workers invest more in firm-specific human capital because of a stronger incentive to make a claim on residual rights[9]. Contrary to Gregorič and Poulsen (2020), I do find that the probability of first-time adoption of BLWR is associated with neither human capital nor workers' tenure in the firm. I do however find some evidence, that BLWR is more likely implemented in firms with family boards when both the share of specialists and share of workers knowledgeable about BLWR is high (Table 2.4, specification 5). In section 5.2 I argue that this finding may indicate that stronger cognitive capabilities (e.g. ability to argue and communicate, access and process information, and negotiate) among firm specialists may explain why the share of specialists that are also knowledgeable about BLWR is positively associated with first-time adoption of BLWR in firms

[9]Gregorič and Poulsen (2020) consider workers with higher firm-tenure and level of education more likely to invest in firm-specific human capital.

with family boards. And that this category of capability is particularly important when entering a family board as worker director.

Following the argumentation of Gregorič and Poulsen (2020), the finding in Table 2.5 may also indicate that workers with higher firm-specific human capital investments have a stronger incentive to make a claim on residual rights in firms with family boards. Simply because family interests are upheld strongly in this group of firms. The fact that I find non-significant, or in some cases even negative, effects of workers' firm tenure on the probability that BLWR is adopted in the first place somewhat undermines the suggested association with workers' firm-specific human capital investments.

2.8 Discussion and conclusion

In this paper, I examined if workers' real freedom to adopt BLWR is sometimes contingent on capabilities for voice (political resources, cognitive resources, and readiness of interlocutors to listen) as defined by Bonvin (2012). And I propose a number of quantitative measures for the three key capabilities. I measure firm workers' knowledge about BLWR from prior employment relations as an indicator of the degree of political resources among workers. If workers are not knowledgeable about BLWR, they are in a weak position to organize and mobilize means to elect worker directors. I choose to measure cognitive resources as both workers' human capital (length of education) and as well as the type of position they hold in the firm. And finally, I measure interlocutors' readiness to listen by the presence of family members among shareholder-elected directors, as we know from

prior literature that strong family values largely silence the voice of workers. First, I show that workers' knowledge about BLWR from personal experience in prior employment relations matters for the probability that BLWR is adopted in firms with family boards. Only, however, when taking into account the share of specialists employed in the firm. I interpret that both political resources (measured as BLWR experience) and cogitative resources are particularly important for the first-time adoption of BLWR in firms with family boards. Second, I find that in firms with a high degree of unionization, workers' experience with BLWR matters for the probability that BLWR is adopted for the first time. I interpret, that unions play a moderating role in the first-time adoption of BLWR on firm-level. Insights from the paper are especially relevant in relation to younger and less experienced parts of the workforce as well as cases of family firms and contribute to the growing literature on heterogeneity between firms with BLWR adopted.

While some of the capabilities examined here are hard politically to influence (e.g. readiness of interlockers to listen), others are easier to strengthen (e.g. workers' political resources in the form of BLWR experience). And because only around 24 percent of firms subject to the legislation on BLWR have adopted BLWR, a substantial fraction of workers have no knowledge about BLWR from prior personal experience. And then there is the economic significance. How are we to think about the apparently modest economic significance (e.g. around 3-4 percentages from a 10 percent change in share of workers with type two BLWR experience? (Table 2.6)). Keeping in mind that BLWR is not adopted in around 76 percent of joint stock firms subject to the law, one could argue the result actually indicates a larger potential to expand workers' real freedom to reach for board-level influence.

That if workers to a greater extent were knowledgeable about the rights, opportunities, and responsibilities of BLWR, more would take the initiative to nominate candidates in the first place. Another aspect worth noticing is the additive nature of the estimated probability that BLWR is established in the first place. It is the probability each year, that BLWR is established for the very first time in that respective firm. Upon initial establishment, BLWR typically is instituted for a longer period of time.

Worker democracy is not a one-person show. It is not about the will of an individual worker only but a collective and democratic construct. It requires collective support from at least 10 percent of firm workers in the first place. And because of this, the idea of a serial worker representative is only possible if democratically supported. Around ¼ of elected worker directors in the very first-time BLWR establishment have also been elected worker directors in a prior employment relation. Regardless if a worker with prior first-hand BLWR experience is herself elected in the new employment relation or not, she has to gather support collectively. And as it is interpreted in this paper, this process involves the sharing of knowledge about BLWR among fellow firm workers.

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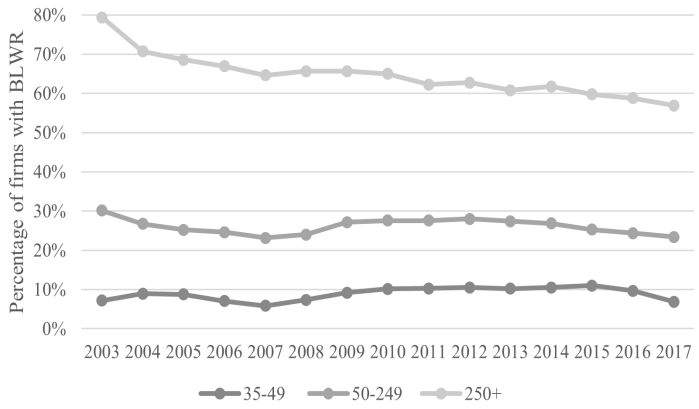
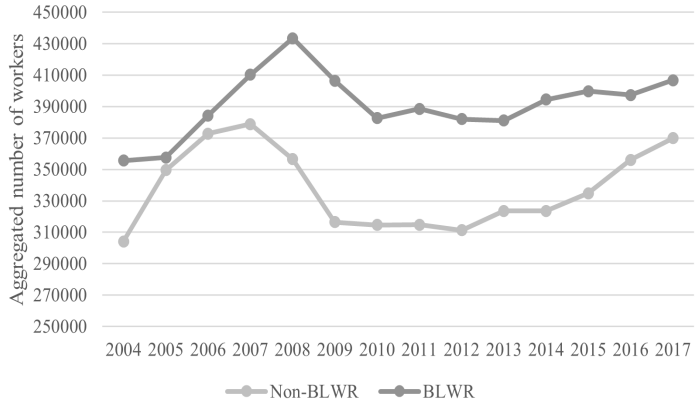
2.9 Tables and Figures

Figure 2.1: BLWR on retreat in larger joint stock firms



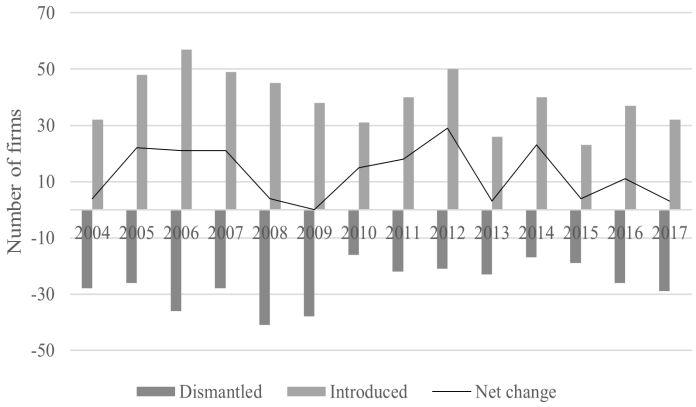
Notes: Only limited liability firms with at least 35 workers each of the past three years. BLWR has dropped both in absolute and relative numbers since early 2000 in the firm size groups 50-249 and 250+ workers.

Figure 2.2: Number of workers if firms with BLWR



Notes: Only limited liability firms with at least 35 workers each of the past three years

Figure 2.3: Changes in BLWR



Notes: Only limited liability firms with at least 35 workers each of the past three years

Table 2.1: Descriptive Statistics

	Full sample			Non-BLWR firms			BLWR newly implemented			
	Mean	Std. dev.	N	Mean	Std. dev.	N	Mean	Std. dev.	N	Difference
First-hand BLWR experience	0.321	1.035	49060	0.148	0.535	36278	0.591	1.398	342	-0.443***
Second-hand BLWR experience	53.395	221.024	49060	30.306	114.435	36278	95.816	385.284	342	-65.510***
Family board	0.278	0.448	49108	0.346	0.476	36317	0.073	0.260	343	0.273***
Share of specialists	0.108	0.195	49057	0.091	0.184	36276	0.164	0.218	342	-0.073***
Share of blue-color workers	0.699	0.246	49057	0.704	0.248	36276	0.682	0.244	342	0.022*
Avg. human capital	2.956	1.158	45508	2.835	1.132	33564	3.421	1.245	320	-0.586***
Avg. tenure	5.625	2.967	45500	5.088	2.707	33556	4.881	2.810	320	0.207
Union density	0.788	0.161	45508	0.765	0.168	33564	0.855	0.096	320	-0.090***
High union density (dummy)	0.529	0.499	49108	0.460	0.498	36317	0.749	0.434	343	-0.290***
Board size	4.331	1.835	49108	3.718	1.330	36317	5.886	1.986	343	-2.168***
Acquisition	0.129	0.335	49108	0.117	0.321	36317	0.175	0.380	343	-0.0584***
Number of workers (in 1,000)	215	846	49108	136	394	36317	298	1.389	343	-0.161***
ROA	0.051	2.000	46168	0.047	2.279	34509	0.039	0.180	318	0.008
Leverage	0.503	1.131	45625	0.523	1.298	34191	0.506	0.280	309	0.017
Firm age	24.941	17.830	49108	22.122	14.328	36317	22.108	18.140	343	0.015

Notes: Only joint stock firms with at least 35 workers each of the past three years. In the last column, differences between non-BLWR firms and firms with BLWR newly implemented. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2.2: First-time adoption of BLER (Probit)

	(1)	(2)	(3)	(4)	(5)
Specification	All firms	<250 workers	≥ 250 workers	Firms with family board	
				No	Yes
First-hand BLWR experience (%)	0.848	0.183	45.94**	1.312	-7.685
	(3.322)	(3.645)	(19.30)	(3.388)	(19.92)
Second-hand BLWR experience (%)	0.602***	0.490**	0.781*	0.600***	-0.338
	(0.169)	(0.201)	(0.402)	(0.176)	(0.832)
Family board	-0.443***	-0.436***	-0.420*		
	(0.0758)	(0.0796)	(0.254)		
Share of specialists (%)	-0.0255	0.000906	-0.536	0.0680	-1.241
	(0.202)	(0.220)	(0.854)	(0.215)	(1.191)
Share of blue-color workers (%)	0.346**	0.266	1.105***	0.464***	-0.517
	(0.154)	(0.171)	(0.422)	(0.171)	(0.508)
Avg. human capital (years)	0.0772**	0.0972***	-0.0300	0.0676**	0.412***
	(0.0303)	(0.0333)	(0.105)	(0.0316)	(0.140)
Avg. tenure (years)	-0.0379***	-0.0383***	-0.0415	-0.0431***	-0.0221
	(0.0127)	(0.0137)	(0.0393)	(0.0136)	(0.0492)
High union density (H.U.D.) (dummy)	0.347***	0.415***	0.177	0.376***	0.00427
	(0.0620)	(0.0719)	(0.174)	(0.0662)	(0.203)
Board size	0.153***	0.172***	0.0884***	0.153***	0.314***
	(0.00979)	(0.0108)	(0.0316)	(0.0101)	(0.0668)
Acquisition	0.0475	0.0856	-0.0277	0.0269	0.158
	(0.0686)	(0.0816)	(0.131)	(0.0716)	(0.301)
Ln(workers)t-1	-0.0101	0.158***	-0.183	-0.00884	0.141
	(0.0351)	(0.0542)	(0.121)	(0.0365)	(0.184)
ROA	0.00465	0.0222	0.100	0.00347	0.672
	(0.0212)	(0.0481)	(0.374)	(0.00611)	(0.597)
Constant	-3.036***	-3.640***	-2.892*	-3.177***	-3.139**
	(0.436)	(0.501)	(1.553)	(0.488)	(1.540)
Observations	42,087	36,360	5,727	29,892	12,195

Notes: The dependent variable is an indicator taking the value one when BLWR is adopted at firm i for the first time. All regressions include sector-time, region-time, and firm effects. The sample period is 2003-2017. Standard errors reported in brackets. Only firms subject to legislation are included in the sample. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2.3: First-time adoption of BLER (PML-FE)

	(1)	(2)	(3)	(4)	(5)
Specification	All firms	$<$ 250 workers	$\geq$ 250 workers	Firms with family board	
				No	Yes
First-hand BLWR experience (%)	0.0289	0.0277	-0.0787	0.0515	0.0432
	(0.131)	(0.133)	(1.114)	(0.162)	(0.150)
Second-hand BLWR experience (%)	0.0132	0.00904	0.0372	0.0169	0.00158
	(0.0113)	(0.0116)	(0.0360)	(0.0144)	(0.00511)
Family board	-0.00738***	-0.00746***	-0.00741		
	(0.00188)	(0.00202)	(0.00679)		
Share of specialists (%)	0.00314	0.00436	0.00549	0.00334	-0.0227
	(0.00928)	(0.0107)	(0.0210)	(0.0110)	(0.0165)
Share of blue-color workers (%)	0.00337	0.00255	0.00906	0.00268	0.00547
	(0.00411)	(0.00447)	(0.0116)	(0.00581)	(0.00529)
Avg. human capital (years)	0.00157	0.00277	-0.00416	0.00272	-0.00179
	(0.00194)	(0.00217)	(0.00620)	(0.00257)	(0.00216)
Avg. tenure (years)	-0.00101*	-0.000676	-0.000257	-0.00140*	-0.000258
	(0.000547)	(0.000570)	(0.00208)	(0.000747)	(0.000510)
High union density (H.U.D.) (dummy)	0.00346**	0.00368***	-0.00457	0.00459**	0.00189
	(0.00141)	(0.00139)	(0.00729)	(0.00213)	(0.00115)
Board size	0.00631***	0.00648***	0.00735***	0.00762***	0.00117
	(0.000801)	(0.000897)	(0.00202)	(0.00102)	(0.000874)
Acquisition	0.000703	0.00187	-0.00522	-0.000233	0.00214
	(0.00173)	(0.00189)	(0.00382)	(0.00224)	(0.00185)
Ln(workers)t-1	-0.00548*	-0.00318	-0.0164	-0.00533	-0.00326
	(0.00303)	(0.00291)	(0.0107)	(0.00391)	(0.00241)
ROA	8.80e-06	-3.22e-06	-0.000398	2.11e-05	0.000212
	(4.26e-05)	(4.68e-05)	(0.0114)	(5.32e-05)	(0.00259)
Constant	0.0289	0.0277	-0.0787	0.0515	0.0432
	(0.131)	(0.133)	(1.114)	(0.162)	(0.150)
Observations	42,087	36,360	5,727	29,892	12,195
Number of unique firms	6,086	5,649	860	4,753	2,255

Notes: The dependent variable is an indicator taking the value one when BLWR is adopted at firm i for the first time. All regressions include sector-time, region-time, and firm effects. The sample period is 2003-2017. Standard errors reported in brackets. Only firms subject to legislation are included in the sample. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2.4: Employment positions and the adoption of BLER (PML-FE)

	(1)	(2)	(3)	(4)	(5)
Specification	All firms	< 250 workers	≥ 250 workers	Firms with family board	
				No	Yes
First-hand BLWR experience (%)	-0.665	-0.490	-5.834	-0.638	-0.655
	(0.486)	(0.469)	(5.971)	(0.619)	(0.726)
Second-hand BLWR experience (%)	-0.0341	-0.0536	0.0930	-0.0195	-0.0251
	(0.0226)	(0.0271)	(0.0623)	(0.0332)	(0.0159)
First-hand BLWR experience × Share specialists (%)	-0.0627	-0.397	8.231	-0.247	2.994*
	(0.769)	(0.782)	(6.651)	(0.891)	(1.729)
Second-hand BLWR experience × Share specialists (%)	0.0288	0.0513	-0.0680	0.00585	0.188**
	(0.0551)	(0.0728)	(0.0785)	(0.0632)	(0.0854)
First-hand BLWR experience × Share blue-color workers	1.021	0.829	6.436	1.090	0.749
	(0.659)	(0.642)	(7.444)	(0.841)	(0.896)
Second-hand BLWR experience × Share blue-color workers	0.0622**	0.0807**	-0.0671	0.0511	0.0256
	(0.0312)	(0.0360)	(0.0919)	(0.0437)	(0.0224)
Family board	-0.00726***	-0.00734***	-0.00755		
	(0.00188)	(0.00203)	(0.00689)		
Share of specialists (%)	-0.00141	-0.00469	0.0117	0.00423	-0.0590**
	(0.0152)	(0.0187)	(0.0324)	(0.0180)	(0.0278)
Share of blue-color workers (%)	-0.0108	-0.0150**	0.0187	-0.0102	0.000240
	(0.00691)	(0.00748)	(0.0233)	(0.0108)	(0.00580)
Avg. human capital (years)	0.00187	0.00298	-0.00427	0.00308	-0.00190
	(0.00194)	(0.00216)	(0.00619)	(0.00257)	(0.00215)
Avg. tenure (years)	-0.000998*	-0.000672	-0.000291	-0.00137*	-0.000233
	(0.000545)	(0.000568)	(0.00207)	(0.000745)	(0.000510)
High union density (H.U.D.) (dummy)	0.00340**	0.00364***	-0.00480	0.00445**	0.00191*
	(0.00141)	(0.00138)	(0.00733)	(0.00212)	(0.00114)
Board size	0.00629***	0.00646***	0.00741***	0.00763***	0.00120
	(0.000801)	(0.000897)	(0.00202)	(0.00102)	(0.000860)
Acquisition	0.000694	0.00189	-0.00518	-0.000240	0.00221
	(0.00173)	(0.00189)	(0.00384)	(0.00224)	(0.00186)
Ln(workers)t-1	-0.00555*	-0.00331	-0.0161	-0.00534	-0.00350
	(0.00303)	(0.00291)	(0.0107)	(0.00391)	(0.00246)
ROA	7.40e-06	-4.44e-06	0.000424	1.90e-05	8.58e-05
	(4.22e-05)	(4.63e-05)	(0.0112)	(5.27e-05)	(0.00262)
Constant	-0.665	-0.490	-5.834	-0.638	-0.655
	(0.486)	(0.469)	(5.971)	(0.619)	(0.726)
Observations	42,087	36,360	5,727	29,892	12,195
Number of unique firms	6,086	5,649	860	4,753	2,255

Notes: The dependent variable is an indicator taking the value one when BLWR is adopted at firm i for the first time. All regressions include sector-time, region-time, and firm effects. The sample period is 2003-2017. Standard errors reported in brackets. Only firms subject to legislation are included in the sample. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2.5: Human capital and the adoption of BLER (PML-FE)

	(1)	(2)	(3)	(4)	(5)
Specification	All firms	< 250 workers	≥ 250 workers	Firms with family board	
				No	Yes
First-hand BLWR experience (%)	0.501	0.632*	-3.532	0.635	-0.347
	(0.345)	(0.345)	(3.892)	(0.441)	(0.276)
Second-hand BLWR experience (%)	0.00739	-0.0189	0.113	0.0176	0.0122
	(0.0295)	(0.0301)	(0.0810)	(0.0385)	(0.0132)
First-hand BLWR experience × H.C. (%)	-0.139	-0.180	1.042	-0.164	0.145
	(0.105)	(0.158)	(0.977)	(0.123)	(0.101)
Second-hand BLWR experience × H.C. (%)	0.00182	0.00898	-0.0244	-0.000308	-0.00416
	(0.00934)	(0.0108)	(0.0193)	(0.0112)	(0.00580)
Family board	-0.00733***	-0.00743***	-0.00762		
	(0.00187)	(0.00202)	(0.00689)		
Share of specialists (%)	0.00313	0.00380	0.00783	0.00339	-0.0227
	(0.00931)	(0.0107)	(0.0215)	(0.0111)	(0.0165)
Share of blue-color workers (%)	0.00337	0.00260	0.00808	0.00253	0.00543
	(0.00411)	(0.00447)	(0.0115)	(0.00578)	(0.00529)
Avg. human capital (years)	0.00137	0.000963	2.77e-05	0.00314	-0.00113
	(0.00277)	(0.00311)	(0.00780)	(0.00359)	(0.00219)
Avg. tenure (years)	-0.00100*	-0.000681	-0.000214	-0.00140*	-0.000252
	(0.000547)	(0.000568)	(0.00206)	(0.000745)	(0.000508)
High union density (H.U.D.) (dummy)	0.00343**	0.00367***	-0.00465	0.00454**	0.00188
	(0.00142)	(0.00139)	(0.00732)	(0.00214)	(0.00115)
Board size	0.00631***	0.00648***	0.00732***	0.00763***	0.00117
	(0.000801)	(0.000897)	(0.00201)	(0.00102)	(0.000876)
Acquisition	0.000702	0.00186	-0.00536	-0.000233	0.00216
	(0.00173)	(0.00189)	(0.00384)	(0.00224)	(0.00186)
Ln(workers)t-1	-0.00549*	-0.00324	-0.0161	-0.00535	-0.00322
	(0.00303)	(0.00291)	(0.0106)	(0.00391)	(0.00240)
ROA	1.00e-05	-6.32e-07	-0.000428	2.19e-05	0.000213
	(4.24e-05)	(4.68e-05)	(0.0113)	(5.29e-05)	(0.00259)
Constant	0.0455	0.0572	0.229**	0.0510	0.0415
	(0.0289)	(0.0640)	(0.116)	(0.0382)	(0.0389)
Observations	42,087	36,360	5,727	29,892	12,195
Number of unique firms	6,086	5,649	860	4,753	2,255

Notes: The dependent variable is an indicator taking the value one when BLWR is adopted at firm i for the first time. All regressions include sector-time, region-time, and firm effects. The sample period is 2003-2017. Standard errors reported in brackets. Only firms subject to legislation are included in the sample. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2.6: Unionization and the adoption of BLER (PML-FE)

	(1)	(2)	(3)	(4)	(5)
Specification	All firms	<250 workers	≥ 250 workers	Firms with family board	
				No	Yes
First-hand BLWR experience (%)	0.0841	0.0432	-0.0780	0.152	0.0644
	(0.218)	(0.221)	(2.079)	(0.298)	(0.0655)
Second-hand BLWR experience (%)	-0.00928	-0.00739	-0.0164	-0.0148	0.00908*
	(0.0134)	(0.0107)	(0.0773)	(0.0184)	(0.00537)
First-hand BLWR experience × H.U.D. (%)	-0.0825	-0.0292	-0.0536	-0.141	-0.0228
	(0.261)	(0.266)	(2.006)	(0.344)	(0.155)
Second-hand BLWR experience × H.U.D. (%)	0.0299**	0.0227**	0.0637	0.0404**	-0.0121
	(0.0137)	(0.0113)	(0.0750)	(0.0182)	(0.00761)
Family board	-0.00747***	-0.00754***	-0.00711		
	(0.00188)	(0.00203)	(0.00686)		
Share of specialists (%)	0.00341	0.00456	0.00621	0.00379	-0.0227
	(0.00927)	(0.0107)	(0.0208)	(0.0110)	(0.0165)
Share of blue-color workers (%)	0.00357	0.00269	0.00984	0.00305	0.00550
	(0.00411)	(0.00447)	(0.0116)	(0.00580)	(0.00529)
Avg. human capital (years)	0.00155	0.00270	-0.00401	0.00276	-0.00173
	(0.00194)	(0.00217)	(0.00623)	(0.00257)	(0.00216)
Avg. tenure (years)	-0.000987*	-0.000642	-0.000377	-0.00138*	-0.000287
	(0.000546)	(0.000571)	(0.00212)	(0.000745)	(0.000511)
High union density (H.U.D.) (dummy)	-0.00277	-0.000955	-0.0223	-0.00446	0.00409**
	(0.00283)	(0.00244)	(0.0189)	(0.00414)	(0.00203)
Board size	0.00630***	0.00648***	0.00737***	0.00760***	0.00117
	(0.000800)	(0.000897)	(0.00201)	(0.00102)	(0.000874)
Acquisition	0.000755	0.00190	-0.00505	-0.000140	0.00214
	(0.00173)	(0.00189)	(0.00384)	(0.00224)	(0.00185)
Ln(workers)t-1	-0.00558*	-0.00323	-0.0171	-0.00555	-0.00327
	(0.00303)	(0.00291)	(0.0107)	(0.00391)	(0.00241)
ROA	1.48e-05	1.48e-06	-0.00118	2.93e-05	0.000252
	(4.25e-05)	(4.67e-05)	(0.0115)	(5.28e-05)	(0.00260)
Constant	0.0506*	0.0532	0.256**	0.0583	0.0414
	(0.0288)	(0.0640)	(0.117)	(0.0379)	(0.0387)
Observations	42,087	36,360	5,727	29,892	12,195
Number of unique firms	6,086	5,649	860	4,753	2,255

Notes: The dependent variable is an indicator taking the value one when BLWR is adopted at firm i for the first time. All regressions include sector-time, region-time, and firm effects. The sample period is 2003-2017. Standard errors reported in brackets. Only firms subject to legislation are included in the sample. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Appendix

Table 2.7: Definition of variables

Variable	*Description*	*Source*
Board characteristics		
BLWR adopted	Dummy for (at least one) first-time worker-elected director	The Danish Business Authority
First-hand BLWR experience	Measures the share of firm-workers who themselves have been elected as board-level worker representatives in a prior employment relation. The measure is computed from 1987 onwards.	The Danish Business Authority
Second-hand BLWR experience	Measures the share of firm-workers who themselves have been employed in a firm prior with BLWR instituted. The measure is computed from 1987 onwards.	The Danish Business Authority
Worker and executive management characteristics		
Number of workers	Total number of workers counted on November 1^{st}	Statistics Denmark
Change in workers	Change in total number of workers since previous year (in %)	Statistics Denmark
Share of executive managers	Share of executive managers out of total number of workers in the firm	Statistics Denmark
Share of specialists	Share of specialists out of total number of workers in the firm	Statistics Denmark
Share of blue-color workers	Share of blue-collar workers out of total number of workers in the firm	Statistics Denmark
High union density	Dummy indicating if the share of total firm-workers are member of a union is above sample median.	Statistics Denmark
Average human capital	Measures average number of years of education after primary school for firm-workers. A bachelor degree counts 3 years of high school + 3 years of university = 6 years in total.	Statistics Denmark

Table 4.14: Definition of variables (continued)

Variable	*Description*	*Source*
Worker and executive management characteristics		
Average tenure	Measures the average tenure of firm-workers. Tenure is computed as the total number of years the individual worker has been employed in the firm.	Statistics Denmark
Accounting-based firm characteristics		
Leverage	Short- and long-term debt standardized by total assets (in %)	Statistics Denmark
ROA	EBIT standardized by total assets (in %)	Statistics Denmark
Log(assets in thousands)	Logarithm of total assets (in 000 DKK)	Statistics Denmark
Other firm and governance characteristics		
Family-related board	Board composition dummy variable indicator of family ties within the board of directors. The variable takes into account parents, children, partners and siblings	Statistics Denmark
Board size	Counts the total number of non-executive directors in the board of directors excluding supplants	Statistics Denmark
Firm age	Number of years since firm establishment	Statistics Denmark
Acquisition	Dummy variable indicating a firm have acquired another firm in year t or t-1 (merger events are excluded from the sample)	Statistics Denmark

Chapter 3

Worker Representation and Job Quality

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Abstract

In this paper, we investigate whether granting workers the right to representation on the board of directors and cooperation committee improves job quality. Industrial democracy is often mentioned in the public debate as a way to guarantee workers fair treatment in the private sector. Yet, the rarity of such institutional mechanisms and the lack of credible measures of job quality have limited empirical research on the topic. Using a regression discontinuity design and country-wide matched employer-worker administrative data and nationally representative questionnaire data (N=38,000), we obtain two main results. First, we find that the regulation translates into board-level worker representation (BLWR) only in highly unionized firms. Second, most job quality effects from the regulation are materialized in firms with a low degree of unionization.

3.1 Introduction

Industrial democracy – institutionalized representation of workers in firms – is often mentioned in the public debate as a way to ensure workers' fair treatment in the private sector (Bryson and Freeman (2012) and Kochan et al. (2019)). However, there is not much empirical evidence on the effect of industrial democracy on job quality. In this paper we investigate if granting workers the right to representation results in better job quality. The modalities of worker representation is a continuing and highly politicized topic. Not only does it relate to the distinction between shareholder supremacy where all residual rights are granted to shareholders and shared governance systems where workers have the right to representation, it too relates to the nuances of how to design the worker representation rights.

In many continental European countries, workers are granted a formal authority in firm decision-making through rights for representation most typically in the board of directors or in works councils (Blandhol et al. (2020) and Harju et al. (2021)). However, both the channel of representation and strength of such rights can take many forms, with great consequences on their functioning (Jäger et al., 2021). In Germany, worker representatives have controlling rights in works councils whereas in countries like Finland, Norway, and Denmark (Conchon, 2011), worker-elected directors hold a minority of seats on the board of directors. It is important to study different forms of worker representations, both to inform debates on first-time introductions and re-formulation of existing institutions. In the U.S., unions are the only legal form of worker representation, and industrial relations systems are more adversarial partly because workers are not represented in

firm decision-making (Harju et al., 2021). In light of this situation, many important voices call for granting workers the right to representation (Bryson and Freeman, 2012; Kochan et al., 2019; Adhvaryu et al., 2019).

We provide quasi-experimental evidence on the effect of granting workers the right to representation in the firm – through presence on the board of directors or cooperation committees – on job quality. We exploit a discontinuity in the regulation, which grants workers in firms with 35 or more employees the right to representation on the board of directors or in cooperation committees, and we implement a regression discontinuity design essentially comparing firms falling on either side of the threshold. Our first finding is that the regulation leads to an increase in the probability that worker-elected directors are present on the board by 5.1 percentage points This result is driven by highly unionized firms, in which the regulation leads to a 17.2 percentage points increase. Second, we do not find that the regulation has an effect of separation rates, wages, and similar register computed measures. However, considering questionnaire-based measure of job quality, we find that the regulation leads to an increase in workers' engagement and motivation in firms with a low degree of unionization. A potential explanation of this finding is that in highly unionized firms, the regulation acts as a duplicate of unions' mission. Finally, we do not find any effects from workers right to representation on questionnaire-based measures such as quality such as concerns of job loss, work-life balance, and the organization of work tasks.

We contribute to the literature examining the effect of worker representation on workers' outcomes in three ways. First, most of the previous literature studying worker representation has relied on correlations, due to the rarity of exoge-

nous variation in such institutional mechanisms. Bryson and White (2016) find for instance a negative association between unionization and job quality, but their estimate is prone to reverse causality issues. We advance previous literature by exploiting clean exogenous variations in worker representation.

Second, among the few papers abstracting from endogeneity concerns (Blandhol et al., 2020; Schneider et al., 2018; Harju et al., 2021), the vast majority rely on measures generated from administrative registers like wage compression, separation rates, wage structures, and absenteeism. Our paper relies on a rich nationally representative questionnaire on the Work Environment and Health conducted by the National Research Centre for the Working Environment. This enables us to obtain clean causal estimates on subjective measures of job quality, such as the planning and organisation of work, engagement in work, concerns of job loss and moves, and work-life balance, from the worker's perspective. To the of best our knowledge, only Harju et al. (2021) estimate the impact of worker representation on workers' subjective well-being, focusing on Finland.

Finally, we differ from previous studies by focusing on Denmark and smaller firms. Most studies examine work councils and board representation in large[2] German firms (Schneider et al., 2018; Gorton and Schmid, 2004). In the Nordics, board-level worker representation has been studied in Finland (Harju et al., 2021) and Norway (Blandhol et al., 2020). An important aspect of the policy debate is whether all firms should be covered by rights for worker representation and how strong this right should be. In the study by Harju et al. (2021), Finnish workers in firms larger

[2]Workers are granted a controlling right in German work councils and on the board of directors in firms larger than 2,000 workers.

than 120 employees are granted 20% of seats on the board of directors. The setting closest to us can be found in Norway (Blandhol et al., 2020), where workers in firms larger than 50 employees can elect 33% of the board of directors. Nonetheless, our focus on another country, smaller firms, and a different regulation might contribute to the wealth of evidence needed to inform more precise aspects of the debate such as firm coverage and the institutional strength of the regulation.

3.1.1 Related literature

Whether workers' job quality benefit from representation on the board-level is the subject of a narrow stream of literature. Results often are contingent on time and the legislative setting, in particular the strength of the right workers are granted, and are often heterogeneous with the degree of unionization.

Blandhol et al. (2020) find no effect of worker representation on wages nor earnings risks, that is, risk of losing jobs and/or wage cuts in a Norwegian context. Though workers in firms with representation at the board level experience higher wages and lower earnings risks, this effect is causally linked to the degree of unionization and not worker representation per se. Blandhol et al. (2020) speculate that the absence of effects from worker representation may be a result of the minority number of seats in the board of directors granted to workers, or of the fact that worker representatives have little or no direct impact on wage setting nor hiring decisions. These results mimic another study by Jäger et al. (2019) on minority board-level representation, which finds no effect on either average wages, wage compression, labor share, or the degree of worker rent-seeking. The Jäger et al. (2019) study from a German context is particularly relevant for this paper, as the

study examines a 1994 reform abruptly abolishing a right for workers to elect a minority of 33% of seats on the board of directors (same as the right secured by the Danish Companies Act) for incorporated stock firms.

Harju et al. (2021) examine the effect of worker board-level minority representation on worker outcomes in a Finish setting and find at best small positive effects on experienced job quality, job security, and wages, and no effects on labor share. Their interpretation is that worker board-level minority representation does little to shift workers' real bargaining power in firm decision-making and that the modest effects originate from increased information sharing and cooperation. Consistent with the modest improvement of job security documented in Harju et al. (2021), Schneider et al. (2018) and Gregorič and Rapp (2019) find lower separation rates during economic shocks in firms with board-level worker representation. Schneider et al. (2018) postulate that board-level worker representation provides workers with informal insurance, by trading wage rent for greater job security. Consistent with their hypothesis, they find that skilled blue collar and white collar workers are less likely to be dismissed following industry shock but also have lower wages. Gregorič and Rapp (2019) study separations and find a lower worker separation sensitivity during the great recession of 2009 as well as lower labor costs per worker in the very same firms. Gregorič and Rapp (2019) concludes that greater cooperation in BLWR firms enabled more flexible time agreements, re-negotiations of bonus systems, and work-sharing agreements.

Very few papers on board-level worker representation on worker outcomes incorporate questionnaire measures of workers' subjective job quality. In a paper by Harju et al. (2021), one of the few studies incorporating measures of subjective

job quality, a questionnaire questioning if supervisors are supportive, obstacles at work, and the relative importance of content and compensation among other things, is examined. In the paper, a total of 21 questionnaire items are indexed based on factor analysis. Harju et al. (2021) find a positive but modest effect on subjective job quality in their difference-in-difference study of a reform in Finland introducing BLWR in firms larger than 150 workers in 1991.

For more extensive literature reviews on consequences of worker representation on worker outcomes in Europe, see Conchon (2011), Jäger et al. (2021), Gregorič (2022), Addison (2009), and Germany, see Gorton and Schmid (2004)).

3.1.2 Potential channels

How can granting workers the right to representation affect job quality? Workers in firms above the 35-worker threshold are granted the right to i) elect representatives making up 33% of the board of directors ii) establish formal cooperation committees, or both. First, regardless of whether worker representation is ultimately implemented, simply granting workers the *right* to be represented may affect job quality through strengthened collective bargaining power (DiNardo and Lee, 2004). Recent evidence suggests that firms are willing to pay to avoid the implementation of worker organisations such as unions (Stansbury, 2021), and the threat of actual implementation may improve workers' positions in the bargaining game.

Second, the actual implementation of one or both of these institutions may affect job quality through coordination and cooperation between workers and manage-

ment (Hirschman, 1970; Freeman, 1980; Freeman and Lazear, 1994). One early explanation has been provided by Hirschman (1970) in the exit-voice theory: workers can defend their interest in the firm either by speaking out, which would directly impact the decision-making process or by leaving the firm, which would influence decision-making indirectly through external labor markets. Establishing formal institutions that give workers co-decision rights may enable workers to directly defend their interests. Even in the absence of direct decision-making power, worker representation may improve cooperation by enhancing trust and facilitating the sharing and transmission of information between the workforce and management (Freeman and Medoff, 1984). Finally, Anderson (2017) argues that the implementation of formal worker representation prevents abuse and mistreatment of workers and improves safety and health at the workplace.

3.1.3 Disposition

The rest of this paper is organized as follows. In section 2, we describe the institutional setting focusing on aspects relevant to the topic of workers' job quality and our empirical design. In section 3 on data, we present our various data sources, how they are combined, and provide summary statistics for our final sample. Furthermore, section 3 focuses on the workers' Work Environment and Health (WEH) questionnaire acquired from the National Research Centre for the Working Environment (NFA). In section 4, we explain our empirical strategy and related tests on identifying assumptions. In section 5, we present the main results of the paper. Section 5 is divided into three parts. In the first part we present results on the determinants of BLWR implementation from the first-stage estimations, in the sec-

ond part we present results on the effect of regulation on worker outcomes from the reduced form estimation, and in part three we present results on implemented BLWR on worker outcomes from the second-stage fuzzy regression discontinuity estimations. In section 6 we reflect on the results and carry out additional robustness checks and heterogeneity analysis. Finally, section 7 concludes with a general discussion of the findings in relation to theory and prior literature.

3.2 Institutional setting

We start by describing the legislation for workers' representation on boards of directors and cooperation committees. We then briefly outline the role of additional institutional mechanisms, namely unions and work-environment committees in the Danish labor market.

3.2.1 Worker representation on boards of directors

The Danish model of corporate governance is characterized by a two-tier model composed of a supervisory board of non-executive directors and the board of executive directors. While executive directors are in charge of running the day-to-day affairs, the supervisory board of non-executive directors (henceforth, "board of directors") is mainly in charge of determining the long-run orientation of the firm strategy, appointing the CEOs, and determining their remuneration. Supervisory boards are subject to the Danish Corporate Governance Code, which defines a number of best practices in relation to e.g., the independence of directors, following a 'comply or explain' principle.

Workers in firms with at least 35 employees have the formal right to elect representatives on the board of directors. The aim of worker representation on boards is to take on the directors' role from a worker perspective. Worker-elected directors have therefore the same rights and responsibilities as other directors, in particular the duty to act in the interest of the firm. Workers-elected directors can fill up to one-third of all seats in the board. In firms above the 35-employee threshold, elections of worker-elected board directors can be initiated if it is requested by i) at least 10 percent of workers in the firm, or ii) a union representing at least 10 percent of the workers, or iii) a majority of the cooperation committee members. Worker representatives are elected for a period of four years. It has to be noted that workers can also voluntarily ask for representation on the board of directors in firms below the 35-employee threshold, but representation is not a right and can be denied if a majority vote cannot be obtained from shareholders.

3.2.2 Worker representation on cooperation committees

In addition, workers and management in firms with at least 35 employees have the right to implement a cooperation committee. The overall aim of the cooperation committee is to "promote cooperation throughout the enterprise, for the benefit of the enterprise as such and the individual employee" (Fulton, 2021). In practice, they mainly have information and consultation rights but no effective voting powers. Their tasks include, e.g., gathering information and communicating the firm's future financial and employment prospects to employees, providing the management information about working conditions, etc.[3] Cooperation committees gen-

[3]Their rights and duties are defined in a national agreement between unions and employer bodies, which covers most of the private sector. There are separate agreements for the agriculture

erally consist of an equal number of employee and management representatives, from approximately two of each in companies with 35 to 50 employees, to six of each in companies above 500 employees. In firms above the 35-employee threshold, a cooperation committee can be established if it is requested by i) a majority of workers or, ii) the employer. The employers' association *Dansk Industri* estimates that cooperation committees are established in 70% of firms larger than 35 employees (Fulton, 2021).

3.2.3 Additional workplace representation institutions

A number of additional channels of worker representation exist in the Danish labor market. First, unions make up a core part of workplace representation in Denmark. 52% (83%) of firms with 5 (50) or more workers have a union representative (Fulton, 2021). Union representatives are in charge of dealing with workers' day-to-day concerns regarding working conditions, wages, work time, and similar arrangements. Second, all firms with at least ten workers have a work environment committee which are in charge of solving work environment issues related to health and safety.

3.3 Data and descriptive statistics

We rely on administrative employer-worker matched data provided by Statistics Denmark for all registered firms in Denmark from the year 2010 to 2018. We merge

and finance sector.

employer-level information (e.g. value-added, leverage, and total factor productivity (TFP)) from the firm administrative registers (FIRM) with employer-worker administrative registers (IDA) to include variables on worker separations, wages, education, immigrants, etc.. This data is combined with publicly available data provided by the Business Authority on board-level information on the number of non-executive directors, worker representatives, and family ties among non-executive directors. Based on this latter data source, we categorise firms with worker representation on the board of directors if at least one worker elected director is registered.

Job quality questionnaire Finally, we merge the employer-worker linked administrative data with questionnaire data on workers' work environment and health (WEH) from the National Research Centre for the Working Environment (NFA). The WEH questionnaire is carried out in waves with approximately 38,000[4] respondents and available in the years 2012, 2014, 2016, and 2018. The questionnaire is sent to a representative sample of workers in Danish workplaces to continuously be able to follow the development in their own perception of their working environment and health. From the WEH questionnaire, we focus on four areas of workers' work environment and health. The four areas are planning and organisation of work, engagement in work, concerns of job loss and moves, and finally work-life balance. In Figure 3.5 we provide an overview of the distribution of answers given by respondents of the questionnaire in or RD sample.

[4]The work environment and health (WEH) questionnaires have approximately 38,000 respondents each year adding up to more than 100,000 unique respondents in total across all years. In each wave, the sample consisted of at least 50,000 workers, and the response rates have been at least 50%. In 2018 the response rate was 60%.

In all estimations, we collapse questionnaire responses from the 2014 and 2016 waves for our 2015 RD sample in order to increase the coverage rate. When collapsing the 2014 and 2016 waves, we obtain a coverage rate of our restricted RD sample[5] of 46.7% of firms and 2.9% of workers with an average of 1.48 workers per firm covered[6]. If we were to collapse all four waves from the year 2012, 2014, 2016, and 2018 the coverage rate of our restricted RD sample is 63.2% of firms and 2.6% of workers. However, we assess that these data points are too distanced from one another in time.

Summary statistics In Table 3.10 we list definitions and sources of all variables included in the paper. And the Table is followed by a Table with descriptive statistics (Table 3.4) of the same variables for respectively the full population and our RD sample with firms in the size range of 16.8 and 53.2 workers[7]. In this article, we exclude joint stock firms and focus solely on limited liability firms. Because it is only mandatory for limited liability firms to have a board of directors, whereas this is voluntary for joint stock firms, we believe the two legal ownership forms represent distinctive cases when it comes to workers' right to representation. From the descriptive statistics in Table 3.4 it appears, that most mean statistics in or restricted RD sample imitates the mean statistics of the full sample (column (2 and (6)) while the variation of most variables is larger for the full sample (column (4 and (8)). The reason for this is, that we exclude both firms smaller than 16.8 work-

[5]See the following section 3.4 for explanations on the restrictions we impost in our 2015 RD sample.

[6]This is 1,914 (2.833) out of 4,099 (97,613) firms (workers) in our restricted RD sample in 2015. Over coverage rate of 46.7% is higher than in prior studies with questionnaires. In the Harju et al. (2021) paper they cover 20% of firm-year observations with one worker per firm.

[7]In section 3.4 we describe how we arrive at this bandwidth restriction of the RD sample.

ers and larger than 53.2 workers in our RD sample. In the RD sample, BLWR is implemented in 3.5% of firms while 81% of workers are unionized. 17% of all firm workers separated from firms in our RD sample during 2015 and this number is composed of around 15% voluntary (i.e. direct job-to-job transitions) and 1.9% involuntary separations (column (6)). During the year, workers are absent because of their own illness on average 2.6% of the contracted work hours. On average across all positions and levels of experience, workers earn a baseline wage of 229.6 DKK per hour and a total hourly wage of 269.6 DKK. The total hourly wage includes an average of 28.7 DKK employer-paid pension contributions.

In the Danish Companies Act, workers are granted the right to elect board-level representatives in limited liability and joint stock firms with at least 35 workers on average in the prior three consecutive years. As stated in the law, this average is computed based on the firms' total recorded ATP contributions[8] and stated in the number of full-time workers. To be aligned with this practice, we compute a measure of 3-year average[9] number of full-time worker equivalents based on recorded ATP contributions at firm-level.

3.4 Empirical strategy

In order to estimate the effect of workers' right to representation on the board of directors and the cooperation committee, we carry out a regression discontinuity

[8] ATP contributions are mandatory and adjusted according to the number of contracted hours for each worker. The contributions help support the Danish labor market and ensure better terms for your workers.

[9] The employment measure in year t is computed based on full-time ATP equivalents in year t-3, t-2, and t-1.

analysis comparing measures of workers' job quality in firms falling just below or above the legislative firm-size threshold. Except for being on different sides of the threshold, the underlying assumption is that firms and workers in the two groups of firms do not differ (Lee and Lemieux, 2009). For each outcome measure Y_i, we estimate a model specified as follows.

$$Y_i = \alpha + \beta \mathbb{1}\{(R_i - 35) \geq 0\} + \lambda(R_i - 35) + \gamma \mathbb{1}\{(R_i - 35) \geq 0\} \times (R_i - 35) + \nu X_i' + \epsilon_i$$
$$for \quad 35 - b \leq R_i \leq 35 + b \tag{3.1}$$

The estimate of interest is β and we allow the linear trend to differ on either side of the threshold. The running variable R_i is specified in accordance with the worker measure defined in the BLWR regulation (i.e. 3-year average number of full-time workers), and $R_i - 35$ measures the distance between the running variable and the threshold of 35 full-time workers defined in regulation. X_i' is a vector of the pre-determined observed firm and firm-level worker characteristics including region and industry. The subscript i in the notation indicates the firm-id. As long as the employers do not perfectly manipulate the running variable and no other discontinuous changes are taking place at the threshold, the coefficient of interest β consistently estimates the effect of workers' right to representation in the board of directors and coordination committee on firm-level workers' job quality measures. Note also, that the subscript t is omitted as the model is estimated on cross-sectional data. When estimating the model, we allow standard errors to cluster on the firm level.

Additional restriction In the analysis, we implement a restriction that excludes the most unstable firms measured as the number of full-time workers according to a computed 3-year average number full-time workers equivalent ATP contributions. All firms crossing the threshold of 35 full-time workers in the year t-1, t, or t+1 are removed from the sample[10]. Not only may it take time for workers to realise that the firm has crossed the legislative firm-size threshold granting them the right to elect representatives it may also takes time for them to organize support, identify candidates, and carry out the election. And at the same time, if workers expect a decline in the number of workers, their incentive to elect representatives may erode as their right might be withdrawn soon. Our sample reduces from 21,208 to 20,569 limited liability firms in 2015 when implementing this restriction on firms' stability.

Choice of bandwidth We follow Calonico et al. (2014) to choose an optimal bandwidth around the regulative threshold of 35 full-time workers. By following the Calonico et al. (2014) approach (CCT) with triangular kernel weights, we estimate the optimal bandwidth to 18.2 workers on both sides of the threshold. And as a result, the RD sample of this paper is restricted to firms with a total number of workers in the range between 16.8 and 53.2 workers. By imposing this restriction, the sample is further reduced from 20,569 to 4,099 firms in 2015[11]. For a more detailed overview, we have computed descriptive statistics both for the full sample and for the restricted sample in Table 3.4. Choosing a smaller bandwidth always reduces bias but at the same time, a smaller bandwidth also reduces precision. A

[10]This restriction imitates a restriction imposed by Blandhol et al. (2020) in a comparable study.
[11]The vast majority of firms dropped are small firms with fewer than 16.8 workers.

widely used approach is to obtain the mean square error optimal bandwidth by minimising the mean square error (MSE). MSE-bandwidth selection is optimal for point estimates, but not optimal for conducting inference. Calonico et al. (2014) have developed a method for obtaining confidence intervals by minimising the Coverage Error Rate (CER).

Order of polynomial Choosing the wrong order of polynomial for the RD regressions may introduce boundary bias in the estimations from in-efficient use of data points away from the threshold. Generally, if the polynomial order is chosen correctly, the estimator efficiently uses observation points both close to and far away from the threshold (Gelman and Imbens, 2019). Gelman and Imbens (2019) warns against the use of higher order polynomials in order to tackle the concern of boundary bias. And as a result, we specify linear polynomials (consistent with Imbens and Lemieux (2008) and Fan et al. (1996) among others) in all baseline estimations before revisiting the concern of polynomial order in a later robustness analysis.

Inclusion of co-variates Continuity of co-variates at the threshold of the running variable is a required identifying assumption in order to obtain unbiased estimates with the RD specification as already discussed. That is, if the distribution of a co-variate conditional on the running variable (number of workers) is continuous at the threshold, including a co-variate in the specification has no effect on the estimated treatment effect since the co-variate, conditional on being close to the threshold, is independent of the decision to comply (i.e. to implement BLWR). However, because we in practice include observations away from the threshold in

order to boost estimation power (in this paper we estimate the optimal bandwidth to 18.2 workers), we may eliminate some bias when including co-variates in the specification. Another argument for including co-variates is potential correlations between the decision to comply and outcome variables. This is an argument also supporting the inclusion of co-variates e.g. in experimental empirical designs (Imbens and Lemieux, 2008). As a result, we include co-variates typically associated with BLWR in related literature including family firm status, and workers' length of education.

External validity A common limitation of the RD design is that the results are not generalizable to the full population other than under strong assumptions such as treatment effect homogeneity (Imbens and Lemieux, 2008). Our estimate of main interest therefore captures the local average effect of the right to representation for the sub-population of firms at the 35-worker threshold. That said, the results of this paper have a high degree of internal validity relative to other non quasi-experimental empirical designs in similar settings with small and medium-sized firms.

3.4.1 Test of identifying assumptions

Our empirical design relies on the assumption that firms do not strategically manipulate the running variable (i.e. number of workers) and that pre-determined observed and unobserved firm characteristics are continuous around the regulation threshold. Below we provide evidence supporting that assumptions are satisfied in this application. In addition to regression estimates, we provide graphical

evidence of the validity of assumptions.

Manipulation around the regulative threshold If employers deliberately manipulated the total number of firm workers we would observe discontinuity in the distribution of firms around the threshold, as some employers would speculate on staying just below the threshold of 35 workers[12] in order to prevent that workers are given the right to elect board-level representatives. In order to test for discontinuity of the running variable at the 35 worker threshold, we implement a McCrary (2008) test and report results in Figure 3.3 alongside a density distribution of the running variable for the complete sample and for firms with above and below median unionization degree. The McCrary (2008) test does not reject continuity of the density at 35 workers, that is, the no-manipulation assumption is satisfied for our RD sample. Our finding is consistent with comparable tests in prior literature by Lin et al. (2018) and Kim et al. (2018) among others. The continuity of the running variable around the threshold may reflect that either i) employer cannot manipulate the number of workers or ii) that worker representation has a negligible effect on firm outcomes in a way that is not desirable from the employers' perspective – and that the employer in turn has no incentive to manipulate the number of workers.

Balance of co-variates When a firm grows larger than the 35-worker threshold, workers are granted the right to elect representatives to the board of directors and

[12]Employers may not only try to avoid BLWR by manipulating the number of workers but also the legal form of the firm. For instance, the BLWR law does not apply to limited liability firms with no board of directors. We observe no systematic change of legal form for firms just below the threshold, but cannot rule out that the BLWR regulation matters for employers' choice of legal form in the first place.

the cooperation committee. In this analysis we need to assume that only regulation is discontinuous and that all other observed and unobserved pre-determined firm and worker characteristics are the same above and below the threshold (here we naturally can only analyse the observed characteristics). To assess the validity of this assumption, we have included a number of graphical mean value representations around the threshold for the share of women and immigrant workers, length of education, union density, and firm age. On purpose, we did not include characteristics that likely are determined by firms' BLWR status such as the share of women non-executive directors (we know that worker-elected directors more often are women compared to their shareholder-elected counterparts). In all panels in Figure 3.2 the solid lines are the linear fitted regressions from model 3.1 with no controls whereas the plotted points are firm means of the dependent variable computed for 1 worker bins.

– Insert Figure 3.2 and Table 3.11 here –

The graphical depictions in Figure 3.2 suggest that all characteristics are continuous around the threshold. Because no other regulation is discontinuous at the same threshold and employers have no incentive to manipulate any of the characteristics, this finding is in line with our expectations.

3.5 Empirical results

In this section, we start by analyzing how the regulation affects worker representation on the board of directors, and whether this relationship is mitigated by other factors. We then turn to estimating the effect of the regulation on job quality, first

using objective measures of separations, sickness leave, and wages based on administrative data, and second using survey-based measure of workers' perception of job quality.

3.5.1 Effect of workers' right to representation on the implementation of worker representation on board-level

In this section we examine the effect of workers' right to representation on the implementation of worker representation on board-level by estimating the first-stage model. Further, we analyze potential moderators by exploring heterogeneity in first-stage estimates based on different characteristics.

Worker-elected board-level directors are sometimes observed in firms smaller than 35 workers. However, as workers are granted the right to elect representatives as the firm grows larger than 35 workers, a jump in the percentage of firms with adopted BLWR of 5.1 percentage points is observed (see Table 3.1 and Figure 3.1).

– Insert Figure 3.1 here –

In all three panels (a)-(c) of Figure 3.1, the solid lines are the linear fitted regressions from model 3.1 with no controls whereas the plotted points are firm means of the dependent variable computed for 1 worker bins. In panel (a) we consider the complete sample whereas panel (b) is restricted only to include firms with below median degree of unionization and panel (c) only firms with above median degree of unionization.

According to Table 3.1, the increase in the probability of BLWR adoption is 5.1 percentage points for the complete sample and 8.3 percentage points for the above

median unionized firms. In the sample of firms with below median unionization, there is no significant increase. Dividing the sample into quartiles according to the degree of unionization further confirms that unionization as a determining factor of BLWR adoption. In the top-25 percentage quartile, the effect of the regulation on BLWR adoption is as high as 17.2 percentage points. This indicates that the regulation increases worker representation on the board of directors by 5.1 percentage points on average, and that the effect is mostly driven by firms with high-union density, where the regulation leads to a 17.2 percentage points increase in board-level worker representation. It also indicates, that regulation has no effect on the actual adoption of BLWR in firms with below median degree of unionization. The estimates in Table 3.1 confirm these results.

– Insert Table 3.1 and 3.2 here –

Consistent with our findings in this first-stage analysis, Gregorič and Poulsen (2020) also identify unionization as a key moderator of BLWR implementations in their paper on determinants of BLWR. We further analyze potential moderators including firms with family ties among non-executive directors, workers' education, and firm age (see Table 3.11, but find no significant effects for any of these moderators. As a robustness check, we moreover estimate our first-stage model with alternative specifications of the dependent variable. We find similar results when dependent variable is defined as the share of worker-elected directors or the number of worker-elected directors, regulation remains a significant explanatory factor (see appendix Table 3.12).

3.5.2 Worker separations, sickness leave, and wage outcomes

In this section, we analyse bundled effects of workers' right to representation in the board of directors and in the cooperation committee on worker separations, sickness leave, and wages. While this is not the core part of the article's analysis, it enables us to benchmark our findings in the existing literature largely focusing on the outcomes included in this section. We start by analysing three measures of worker separations, all defined in accordance with the paper by Harju et al. (2021). We analyse all worker separations computed as all kinds of job separations as the fraction of the total number of firm workers. We compare the employment status of workers by November 1st in the current year relative to the employment status of the same workers also by November 1st of the subsequent year. If a worker is no longer registered with the same employer the subsequent year it is indicated as a separation. Further, we divide all worker separations into voluntary worker separations in cases where the worker has entered a new employment relation in another firm the subsequent year (i.e. direct job-to-job transitions) and involuntary worker separations if the worker is registered unemployed the subsequent year. If the worker transitions directly into a new employment relation the subsequent year it more likely reflects a voluntary separation whereas a transition into unemployment more likely reflects an involuntary separation (Harju et al., 2021). We report results in Table 3.3 column (1) to (3) and Table 3.4 graph (a) to (c). Neither the estimated results nor the graphical representations, there are any indication of significant effects.

– Insert Table 3.3 to 3.4 here –

Next, we analyse the effects on sickness leave of firm workers. As outlined in Table 3.10, sickness leave is recorded in the administrative registers combined both for paid hours of absence due to own illness and children's illness. In order only to capture the sickness leave due to workers' own illness, we excluded all workers with children below the age of 18 when computing the measure. The measure of sickness leave is computed as the percentage relative to contracted hours for each worker before a firm-level average is calculated. We report results in Table 3.3 column (4) and Table 3.4 graph (d). We find no indication of significant effects the estimated results or the graphical representations.

Finally, we analyse two measures of workers' hourly wages. The first basic hourly wage measure captures the average baseline contracted wage of all firm workers whereas the total hourly wage measure in addition to the average baseline contracted wage also includes employer-paid pension, overtime payments, and bonuses per hour worked on average for all firm workers. We report results in Table 3.3 column (5) to (6) and Table 3.4 graph (e) to (f). We find no indication of significant effects the estimated results or the graphical representations.

3.5.3 Job quality questionnaire outcomes

Next, we analyse the bundled effects of workers' right to representation on the board of directors and in the cooperation committee on the job quality questionnaire outcomes. We estimate model 3.1 specified in section 3.4 and include industry and region fixed-effects.

From the questionnaire we have computed different arithmetic indexes for each of the four overarching themes; planning and organisation of work, engagement

in work, concerns of job loss and involuntary moves, and work-life balance. Estimated results are displayed in Tables 3.5 to 3.8 including computed control means.

– Insert Table 3.5 to 3.9 here –

Overall, there is little evidence that the regulation has an effect on workers' perception of job quality with the exception of workers' experienced work engagement. In Table 3.5 we display our results including including control means. From Table 3.5 it appears, that we estimate an -0.226 (SE 0.104) effect on the work engagement index for the full sample (column (1)) and an -0.403 (SE 0.170) effect on the work engagement index for the below median unionization sample (column (3)). For the full sample, we calculate a control mean of 2.364 and 2.380 for the below median union density firms. Note that negative estimates indicate a higher degree of work engagement (see Table 3.5 with descriptive statistics of individual questions from the questionnaire) on a 1 to 5 points scale. These results suggest that the effect for the overall sample is driven by below-median unionization firms. The effect is insignificant for the above median unionization firms. In Table 3.9 we unfold the results on work engagement by examining each of the five sub-questions and find, that results primarily are driven by workers' motivation (-0.292 (SE 0.204)), engagement with work tasks (-0.405 (SE 0.189)), and sense of meaning (-0.504 (SE 0.198)) whereas workers' self-confidence and inspiration are insignificant.

3.5.4 Bandwidth choice robustness

In order to challenge the robustness of our main results, we test the sensitivity of our main results to different bandwidth choices. For our baseline estimations, the

optimal bandwidth is estimated to be 18.2 workers when following the Calonico et al. (2014) approach (CCT) with triangular kernel weights (as described in section 3.4). For this analysis, we re-estimate the same baseline specifications as presented in Table 3.5 and 3.9 with bandwidths varying from 5 to 31 workers by 2 worker increments on each side of the 35-worker threshold. Results are presented in Table 3.6.

– Insert Table 3.6 here –

Whereas the results on the work engagement index for the full population in Table 3.5 converts insignificant on a 95% significance level as bandwidths exceed 23 workers on each side of the threshold, all other results that are significant in our baseline specifications of Table 3.5 and 3.9 remain significant for all bandwidths. That is, workers' right to representation remains causally lined to lower values of the overall engagement index as well as workers' experienced meaningfulness, motivation, and engagement at work are all robust to changes in the bandwidth restriction. For all estimated results it however appears, that the estimated magnitude of effects decreases slightly as the bandwidth increases (see Table 3.6).

3.6 Interpretation and suggested channels

Whereas we find no evidence that workers' right to representation has an effect on separations, sickness leave, or wages, we find a modest but robust effect on workers' job quality measured by workers' engagement and motivation. This latter effect on workers' engagement and motivation is driven by firms with a low degree of unionization. We find no effects on worker reported concerns of job loss

and involuntary moves, planning and organization of work, and work-life balance in the analysis of the work environment and health questionnaire data. Noteworthy, the finding that workers' right to representation has no effect on separations – including involuntary separations – is aligned with the finding that workers' concerns of job loss and involuntary moves are not affected either. Further, we confirm the results from Blandhol et al. (2020) and Gregorič and Poulsen (2020), that unions play an important role in implementing BLWR at the firm level, supposedly because of their coordinating capabilities. Paradoxically, these results suggest that while unions are important for the implementation of worker representation on the board of directors, the effects of worker representation on worker outcomes are absent in firms with a high degree of unionization.

Are these results surprising? First, if we compare the absence of effects on worker separations, sickness leave, and wages to findings in the existing literature, the results are hardly surprising. Both Blandhol et al. (2020) and Jäger et al. (2019) find no effects of BLWR on the same outcomes in Norwegian and German contexts respectively, as discussed in section 3.1.1. Harju et al. (2021) find, in their own words, a modest effect on wages in their study. The Harju et al. (2021) study examines a 1991 reform in firms of around 150 workers in Finland, with differences in both the period in time studied, the firm sizes, and institutional contexts from the context of this article. Though collective bargaining takes place in Finland, Harju et al. (2021) argue that considerable discretion on wage setting takes place on the firm level including wage floors. This level of firm-level discretion in Finland seemingly is greater than in the Danish labor market where wage floors are binding in the vast

majority of industries. Finally, Gregorič and Rapp (2019) find lower separation rates in BLWR firms in times of financial recessions. As 2015, the year studied in this article, is not in the midst of a financial recession, our results do not contradict the findings of Gregorič and Rapp (2019).

Moving on to prior studies on the effects of BLWR on questionnaire measured job quality of workers, the only existing really comparable – to our knowledge – is by Harju et al. (2021). As discussed in section 3.1.1, Harju et al. (2021) compute a job quality index relying on factor analysis of 21 questionnaire items and do not study any of the effects of BLWR on any individual questionnaire items. Harju et al. (2021) find a modest positive effect on workers' job quality from granting workers the right to formal representation in the board of directors. As we in this article find a positive effect on only one out of four studied categories of job quality questionnaire items in this article, workers' engagement in work, our result mimics the finding of Harju et al. (2021). This is despite of the institutional and other contextual differences already discussed between the Harju et al. (2021) article examining a 1991 reform in firms of around 150 workers in Finland and our article analyzing a Danish context.

There may be a number of reasons for largely absent results both in this article and in the literature more generally, as reviewed in section 3.1.1. First, it may suggest that the workers' right to representation is too inadequate – for the most part – to alter neither the bargaining power of workers or the cooperation, coordination, and information sharing between workers and management. That is, the right for

workers to elect a maximum of one-third of the board of director seats simply – on average – is too little to influence the agendas of boards to generate a better quality of work for the firm workers.

A second explanation is the general equilibrium effects of worker representation institutions on the labor market as a whole. That is, worker representation in the board of directors and other bodies since the mid-1970s arguably has changed the terms for workers generally and eroded differences between firms with and without worker representation. If greater differences in the terms of employment remained between firms with and without formal worker representation, one would expect a drain of talent from firms without worker representation to firms with worker representation implemented. A third explanation is that we might consider outcomes different from the ends pursued by worker representatives or underestimate the heterogeneity of ends pursued by worker representatives. That is, worker representatives may push agendas on the board of directors and coordination committee incredible specific to the individual firm, industry, or even to the individual worker elected representative. This latter explanation also relates to the way workers' terms of employment are negotiated and secured by law. In Denmark, for instance, wages and several other contractual terms are agreed upon in collective agreements through three-part negotiations with unions, government representatives, and the employers' organization, and perhaps similar arrangements are part of the reason why this article and literature generally have found no effects e.g. on wages.

Theoretically in this paper – as for the worker representation literature at large

– worker representation is suggested to alter coordination, cooperation, and information sharing been workers and the managerial team. And as we argue in this article, these changes may in turn improve the job quality of workers. If this line of theoretical reasoning is to be trusted, based on the findings of this article and the related literature discussed in section 3.1.1 workers at large do not benefit from improved coordination, cooperation, and information sharing. Another logical explanation of course is, that workers' right to representation in the board of directors and cooperation committee as defined in the Danish Companies Act is not sufficient for generating these proposed synergies as already discussed. That is, the workers' right to representation evidently does little to shift workers' real bargaining power as suggested by Harju et al. (2021).

As already pointed out, we do, however, report a robust effect of workers' right to representation on workers' job quality measured as workers' engagement in work in firms with a low degree of unionization. But why workers' reported engagement in work? And why in firms with a low degree of unionization? And how does this result relate to the theoretical outline of the article? Let us consider the questions one by one.

First, why do we only find effects on workers' reported engagement in work? We do not observe any measurable changes in other worker outcomes that can explain the underlying or moderating reason for workers' improved reported engagement. That is, workers' right to representation does not materialize in effects on wages, sickness leave, etc. as just discussed. As a result, the increase in workers' reported engagement in work may not be driven by any tangible changes in terms of work but instead driven by workers who experience a greater potential for influencing

firm decision-making even if not materialized. We interpret, that while workers right to representation evidently does not resolve in any tangible changes in the terms of employment for workers, their bargaining power has been leveraged and in turn improved workers' reported engagement in work.

Second, why is the effect driven by firms low degree of unionization? We interpret that the worker representation right fills out a void in low-unionized firms that resolves in slightly improved job quality for workers in this group of firms. In firms with a low degree of unionization, workers' opportunities for involvement in firm decision-making are weak relative to the opportunities of workers in firms with a high degree of unionization. And in this void, the workers' right to representation suggestively play for the bargaining power of workers. Still, however, the result is somewhat surprising keeping in mind our first-stage results, that implementation of worker representation on board-level is largely driven by the degree of unionization. Whereas unions suggestively support and advocate for the implementation of worker representation on board-level, unions and workers do not manage to leverage workers' right to representation into additional effects on neither job quality nor workers separations, sickness leave, or wages.

What then are the theoretical implications? Unless the mechanism of greater job quality works through the implementation of cooperation committees, the estimated effects seem to be working through a strengthened bargaining power and not formal channels of coordination, cooperation, or information sharing. As discussed in the 3.1.2 section, the worker representation right may work as a credible threat that workers implement representation in either the board of directors or the cooperation committees and ultimately leverage workers' bargaining power

within firms – and this may be the driving mechanism behind the findings on workers engagement in this article.

3.7 Conclusion

Does workers' job quality benefit from a right to formal worker representation on the board of directors and cooperation committee? This article contributes to a narrow but growing literature on the effects of worker representation on worker outcomes by focusing on questionnaire-based measures of job quality. As we discuss in this article, the existing literature so far focus on objective outcomes such as wages and separations, and finds very little evidence that workers benefit from formal representation. As a consequence, in this article, we analyze questionnaire measures of job quality – a type of outcome only analyzed in one prior article by Harju et al. (2021) – in the distinctive Danish legislative setting by applying a regression discontinuity design for proper identification.

First, we find that the implementation of BLWR is driven almost solely by the degree of unionization. We interpret that the process of collectively informing workers about their rights, organizing workers' support, arranging elections, and so forth not only requires knowledge about the legislative system and its functioning but also organizational expertise. And here unions may play an almost indispensable role as coordinators.

Second, we find that the positive effect of workers' right to representation on job quality is only consistently found in firms with a low degree of unionization. In firms with a low degree of unionization, we find no consistent effects on job quality.

Further, the effect found in low unionization degree firms only holds for workers' experienced work engagement whereas dimensions of job quality such as concerns of job loss, work-life balance, and the organization of work tasks seemingly are unaffected by worker's right to representation.

Paradoxically, while unions are important for the implementation of worker representation on the board of directors, unions are not successful in ultimately transforming workers' right to representation into improved job quality of workers. This is the takeaway when we combine the finding that the implementation of BLWR is driven almost solely by the degree of unionization with the finding that the effects of worker representation on worker outcomes are absent in firms with a high degree of unionization.

In the article we estimate the effect of workers' right to representation, which is distinct from the effect of the actual implantation of worker representation. While the findings of this article as just described appear paradoxical, we argue for the contrary. As argued in the theoretical section 3.1.2, because workers' right to representation may work as a credible threat of formal implementation of worker representation, the right to worker representation may affect worker outcomes even if representation is not formally implemented. Both the finding that (1) effects of workers' right to representation apply only in firms with little formal implementation of BLWR, that is, in firms with a low degree of unionization, and (2) only workers reported engagement in work – a relatively intangible side to workers' job quality – is affected. We interpret that the worker representation right fills out a void in low-unionized firms where workers' experiences with involvement

in firm decision-making are rare relative to the opportunities of workers in firms with a high degree of unionization.

Going forward, we want to disentangle the effects of worker representation on cooperation committees and the board of directors respectively on workers' job quality by running questionnaires on cooperation committee adoptions and additional questions of job quality targeting firms within our bandwidth firm size. Moreover, we think it is important to further explore the mechanism behind the relatively modest effects on workers' job quality documented here. In the article, we conclude that the effects are driven by a bargaining power mechanism, but because we do not find any evidence of effects on neither worker separations, sickness leave, or wages to explain the questionnaire findings, the mechanism may also be a purely psychological effect of improved bargaining power or experienced autonomy among workers. This later idea is further supported by the 'intangible' nature of our findings limited to dimensions of job quality such as motivation and meaningfulness.

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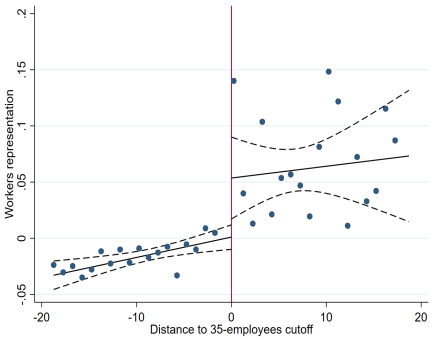
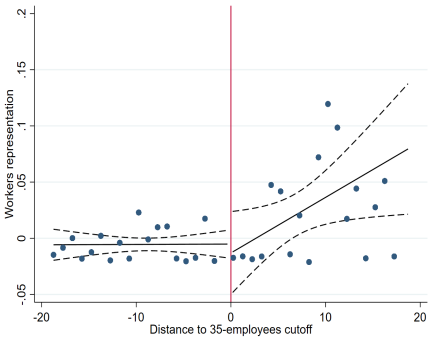
3.8 Tables and Figures

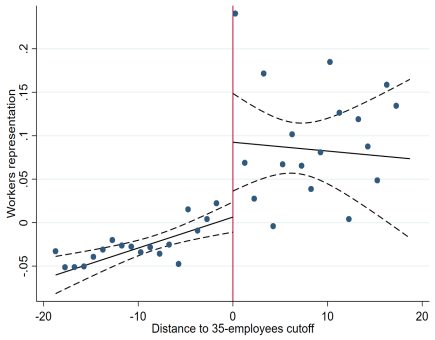
Figure 3.1: Probability that worker representation on board-level is implemented



(a) All firms



(b) Below median unionization degree



(c) Above median unionization degree

Notes: In these figures, the estimates of equation (3.1) are plotted for respectively all firms, and firms with unionization among workers above and below median. The plots are using a linear trend with triangular weights. The dashed lines are 95 percent confidence intervals. (perhaps also... Panel (a) plots the residualized rates of board-level worker representation with respect to region and industry fixed-effects. The running variable is defined as the 3-year average number of workers on firm-level.)

Table 3.1: First stage: effect of the regulation on worker representation on board-level

Dependent var.:	*Worker representation on board-level*		
	Full sample	Below median union density	Above median union density
	(1)	(2)	(3)
Above 35	0.051**	-0.006	0.083**
	(0.025)	(0.016)	(0.040)
1-digit industry F.E.	✓	✓	✓
Region F.E.	✓	✓	✓
Control Mean	.015	.012	.019
R^2	.069	.027	.115
Observations	3994	1992	2000

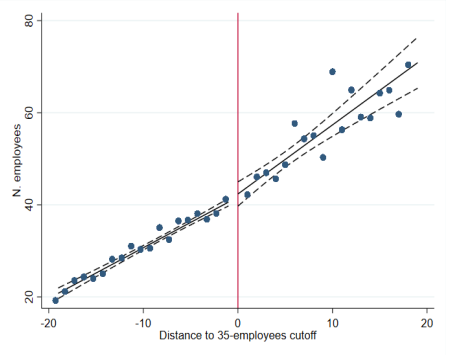
Notes: Regressions control for a full set of region and industry indicators. The sample is restricted as defined in section 3.4 to firms with between 16.8 and 53.2 workers which remained above or below the threshold of 35-workers in years t-1, t, and t+1. The sample is restricted to year 2015. All columns report estimates of the coefficient β from equation **??**. t statistics in parentheses and significane levels are indicated as * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.2: First-stage: effect of the regulation on worker representation, by quartile of union density

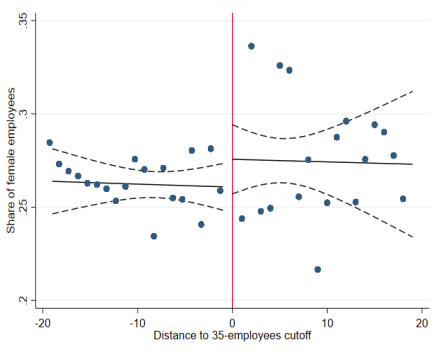
Dependent var.:	*Worker representation*			
Union density:	Bottom 25%	26 to 50%	51 to 75%	Top 25%
	(1)	(2)	(3)	(4)
Above 35	-0.031**	0.016	0.006	0.172**
	(0.015)	(0.027)	(0.040)	(0.069)
1-digit industry F.E.	✓	✓	✓	✓
Region F.E.	✓	✓	✓	✓
Control Mean	.012	.012	.015	.022
R^2	.03	.038	.079	.17
Observations	992	1000	1003	997

Notes: Regressions control for a full set of region and industry indicators. The sample is restricted as defined in section 3.4 to firms with between 16.8 and 53.2 workers which remained above or below the threshold of 35-workers in years t-1, t, and t+1. The sample is restricted to year 2015. All columns report estimates of the coefficient β from equation **??**. t statistics in parentheses and significane levels are indicated as * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

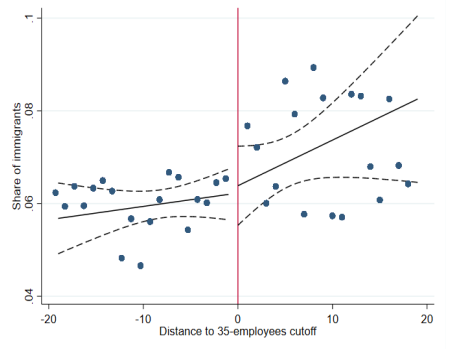
Figure 3.2: Smoothness of pre-determined characteristics



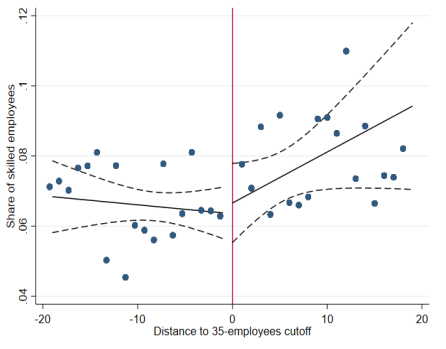
(a) Number of workers



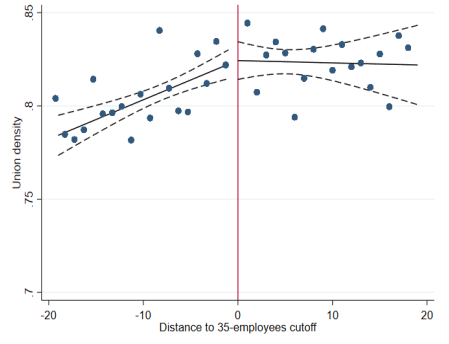
(b) Share of women workers



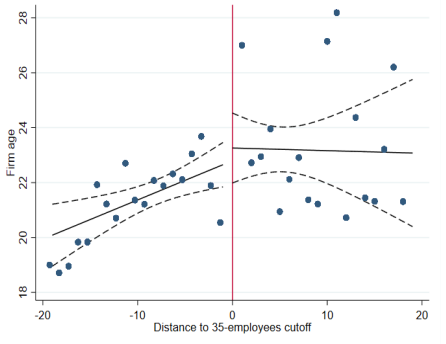
(c) Share of immigrant workers



(d) Share of skilled workers



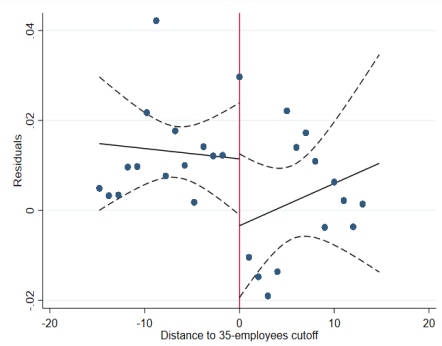
(e) Union density



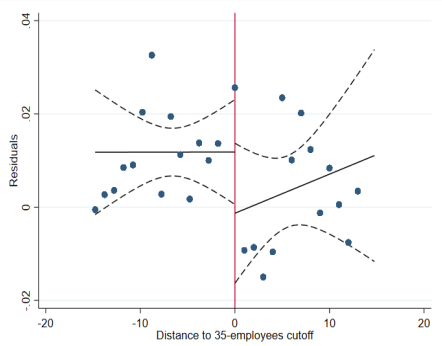
(f) Firm age

Notes: The figure plots means of pre-determined firm-level and worker characteristics. The running variable is defined as the 3-year average number of workers on firm-level. As variables are plotted against the running variable, the variation in panel (a) can be interpreted as stability of firms' employment.

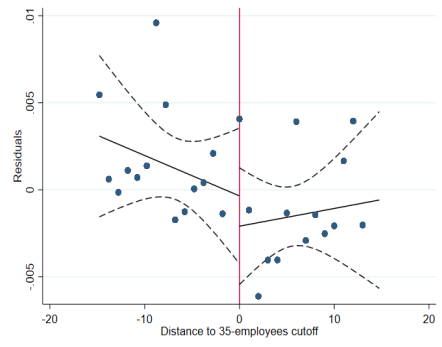
Figure 3.4: Effects of BLWR regulation on worker outcomes



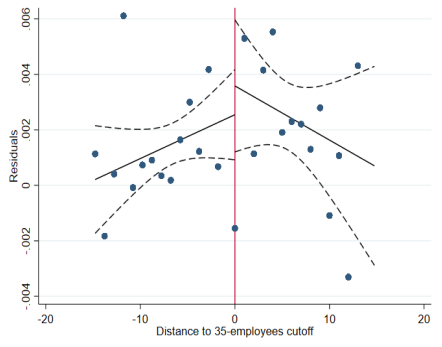
(a) All separations



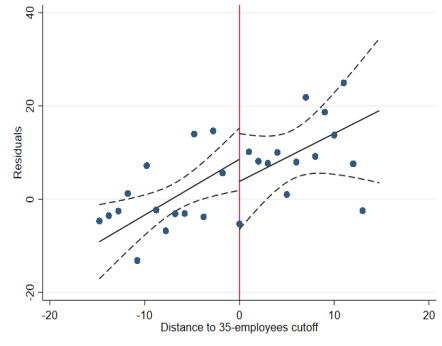
(b) Voluntary separations



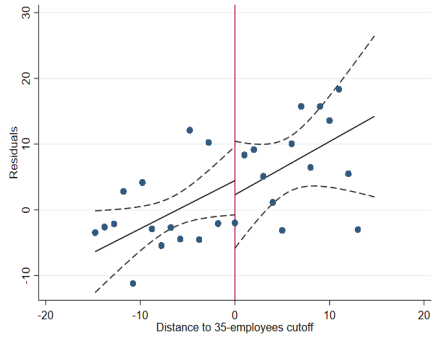
(c) Involuntary separations



(d) Sickness leave



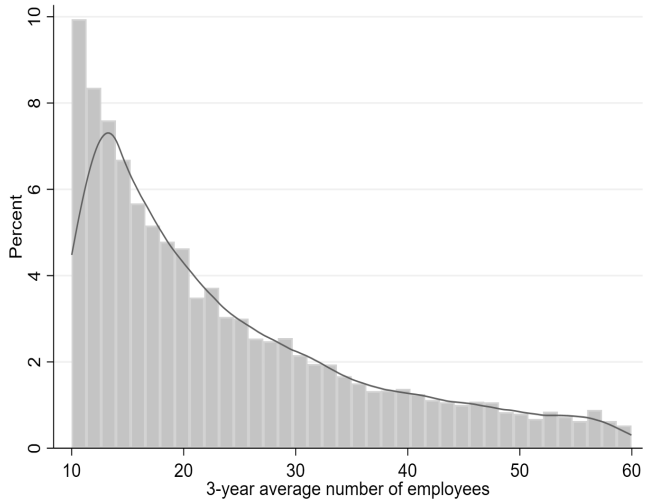
(e) Total hourly wage



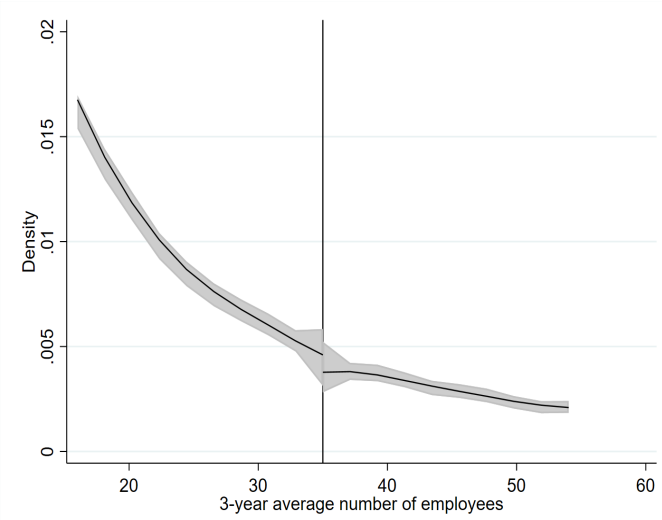
(f) Baseline hourly wage

Notes: Panel (a)-(f) plot residualized dependent variables with respect to region and industry fixed-effects. The running variable is defined as the 3-year average number of workers on firm-level. The sample is restricted as defined in section 3.4 to firms with between 16.8 and 53.2 workers which remained above or below the threshold of 35-workers in years t-1, t, and t+1. The sample is restricted to year 2015. The plots are using a linear trend with triangular weights. The dashed lines are 95 percent confidence intervals.

Figure 3.3: Manipulation of running variable



(a) Histogram of running variable with bins of 1.5 workers and estimated distribution



(b) Estimated distribution of running variable separately below and above threshold

Notes: The figures display non-parametric estimates of the density of the running variable, number of full-time workers, below and above the 35-worker threshold. Each bar in panel (a) shows the average number of workers per firm for each 1.5 worker bin and the solid line represent the estimated distribution. The bottom figure (b) displays a graphical representation of the McCrary (2008) test with estimated distributions on each side of the threshold.

Table 3.3: Effects of worker representation right on worker separations and wages

	All separations	Voluntary separations	Involuntary separations	Sickness leave	Total hourly wage	Basic hourly wage	Hourly pension
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Above 35	0.019	0.013	0.006	0.002	5.456	3.841	2.137
	0.012	0.011	0.005	0.001	7.768	6.394	1.306
1-digit industry F.E.	✓	✓	✓	✓	✓	✓	✓
Region F.E.	✓	✓	✓	✓	✓	✓	✓
Control Mean	.176	.158	.018	.028	276.641	234.853	30.009
R^2	.002	.002	.002	.002	.004	.003	.006
Observations	2521	2521	2521	2443	2447	2447	2447

Notes: Regressions control for a full set of region and industry indicators. The sample is restricted as defined in section 3.4 to firms with between 16.8 and 53.2 workers which remained above or below the threshold of 35-workers in years t-1, t, and t+1. The sample is restricted to year 2015. All columns report estimates of the coefficient β from equation 3.1. t statistics in parentheses and significance levels are indicated as * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.5: Reduced form: effect of the regulation on work engagement index

Dependent var.:	*Work engagement index*		
	Full sample	Below median union density	Above median union density
	(1)	(2)	(3)
Above 35	-0.226**	-0.403**	-0.098
	0.104	0.170	0.133
1-digit industry F.E.	✓	✓	✓
Region F.E.	✓	✓	✓
Control Mean	2.364	2.380	2.350
R^2	.068	.104	.073
Observations	861	392	469

Notes: Regressions control for a full set of region and industry indicators. The sample is restricted as defined in section 3.4 to firms with between 16.8 and 53.2 workers which remained above or below the threshold of 35-workers in years t-1, t, and t+1. The sample is restricted to year 2015. All columns report estimates of the coefficient β from equation 3.1. t statistics in parentheses and significance levels are indicated as * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.4: Descriptive statistics

	Full sample				RD sample			
Variable	N (1)	Mean (2)	Median (3)	Std. dev. (4)	N (5)	Mean (6)	Median (7)	Std. dev. (8)
Panel A. Firm and board characteristics								
Firms with BLWR	20134	0.043	0	0.20	4007	0.035	0	0.18
Number of workers	20569	33.2	8	240.1	4099	27.9	25	10.2
Family board	20134	0.50	0	0.50	4007	0.41	0	0.49
Size of board	20134	3.57	3	1.07	4007	3.73	3	1.11
Union density	19305	0.73	0.80	0.27	3997	0.81	0.83	0.13
Foreign board	20134	0.18	0	0.39	4007	0.20	0	0.40
Firm age	20569	19.1	15	14.9	4099	21.9	18	13.9
Value added per worker (1,000 DKK)	19538	852.2	529.3	29528.6	3996	647.6	536.7	817.8
Total factor productivity	13279	1.93	1.01	11.0	2991	1.72	1.03	4.39
Panel B. Worker characteristics								
Workers' average education	19305	3.20	3	1.52	3997	3.04	2.73	1.25
Share of female workers	19305	0.27	0.21	0.25	3997	0.27	0.21	0.21
Share of immigrant workers	19305	0.055	0	0.12	3997	0.062	0.036	0.095
Share of skilled workers	19305	0.078	0	0.18	3997	0.070	0	0.13
All separations (pct.)	18547	0.16	0.12	0.18	3988	0.17	0.14	0.13
Voluntary separations (pct.)	18547	0.14	0.10	0.17	3988	0.15	0.13	0.12
Involuntary separations (pct.)	18547	0.018	0	0.061	3988	0.019	0	0.042
Worker absence	8545	0.025	0.025	0.11	3841	0.026	0.025	0.017
Total basic wage	8608	231.2	216.6	66.9	3860	229.6	214.9	65.8
Total hourly wage	8608	271.3	254.5	82.1	3860	269.6	252.7	80.7
Pension per hour	8608	29.0	28.0	14.4	3860	28.7	27.8	14.1

Notes: Table 3.4 displays number of observations, mean, median, and standard deviation for all relevant variables. The definition of variables are described in table 3.10. The table report descriptive statistics for the full sample of limited liability firms in column (1) to (4) and for the RD sample of stable limited liability firms in column (5) to (8) in the wridth between 16.8 and 53.2 workers as defined in section 3.4 for year 2015.

Table 3.6: Reduced form: effect of regulation on job loss index

Dependent var.:	*Job loss index*		
	Full sample	Below median union density	Above median union density
	(1)	(2)	(3)
Above 35	0.053	0.088	0.063
	0.097	0.156	0.124
1-digit industry F.E.	✓	✓	✓
Region F.E.	✓	✓	✓
Control Mean	4.123	4.128	4.118
R^2	.053	.097	.05
Observations	883	402	481

Notes: Regressions control for a full set of region and industry indicators. The sample is restricted as defined in section 3.4 to firms with between 16.8 and 53.2 workers which remained above or below the threshold of 35-workers in years t-1, t, and t+1. The sample is restricted to year 2015. All columns report estimates of the coefficient β from equation 3.1. t statistics in parentheses and significance levels are indicated as * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.7: Reduced form: effect of regulation on work organisation index

Dependent var.:	*Work organisation index*		
	Full sample	Below median union density	Above median union density
	(1)	(2)	(3)
Above 35	-0.054	-0.176	0.030
	0.102	0.147	0.139
1-digit industry F.E.	✓	✓	✓
Region F.E.	✓	✓	✓
Control Mean	2.339	2.416	2.268
R^2	.05	.11	.043
Observations	820	371	449

Notes: Regressions control for a full set of region and industry indicators. The sample is restricted as defined in section 3.4 to firms with between 16.8 and 53.2 workers which remained above or below the threshold of 35-workers in years t-1, t, and t+1. The sample is restricted to year 2015. All columns report estimates of the coefficient β from equation 3.1. t statistics in parentheses and significance levels are indicated as * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.8: Reduced form: effect of regulation on work-life balance index

Dependent var.:	*Work-life balance index*		
	Full sample	Below median union density	Above median union density
	(1)	(2)	(3)
Above 35	-0.057	0.031	-0.086
	0.065	0.104	0.081
1-digit industry F.E.	✓	✓	✓
Region F.E.	✓	✓	✓
Control Mean	2.931	2.889	2.969
R^2	.045	.116	.054
Observations	862	393	469

Notes: Regressions control for a full set of region and industry indicators. The sample is restricted as defined in section 3.4 to firms with between 16.8 and 53.2 workers which remained above or below the threshold of 35-workers in years t-1, t, and t+1. The sample is restricted to year 2015. All columns report estimates of the coefficient β from equation 3.1. t statistics in parentheses and significance levels are indicated as * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.9: Reduced form: Engagement in work in low unionized firms (individual questions)

Do you agree?	Self-confidence from work	Inspiring tasks	Work is meaningful	Feeling motivated	Engaged by tasks
	(1)	(2)	(3)	(4)	(5)
Above 35	-0.272	-0.507	-0.504***	-0.292**	-0.405**
	(0.186)	(0.195)	(0.198)	(0.204)	(0.189)
1-digit industry F.E.	✓	✓	✓	✓	✓
Region F.E.	✓	✓	✓	✓	✓
Control Mean	2.342	2.421	2.277	2.384	2.469
R^2	.017	.035	.092	.012	.020
Observations	392	393	393	393	393

Notes: Regressions control for a full set of region and industry indicators. The sample is restricted as defined in section 3.4 to firms with between 16.8 and 53.2 workers which remained above or below the threshold of 35-workers in years t-1, t, and t+1. The sample is restricted to year 2015. All columns report estimates of the coefficient β from equation 3.1. t statistics in parentheses and significance levels are indicated as * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Appendix

Table 3.10: Definition of variables

Variable	*Description*	*Source*
Board characteristics		
Family board	Two or more board directors have family ties.	Business authority and administrative registers
Board size	Total number of board directors including worker directors. Deputies are excluded.	Business authority registers
Share of women directors	Share of women directors.	Business authority and administrative registers
Number of board-level worker representatives	Number of board-level worker representatives in the board of directors.	Business authority and administrative registers
BLWR board	Dummy indicating if at least one worker representative is represented in the board of directors.	Business authority and administrative registers
Firm accounts		
Leverage		Accounting registers
Value added	Revenues minus cost of inputs.	Accounting registers
Value added per worker	Revenues minus cost of inputs divided my total number of firm workers.	Accounting and administrative registers
Total factor productivity (TFP)	Estimated using a Cobb-Douglas production function with capital and labor on industry level.	Accounting registers
Firm characteristics		
Firm age	Number of years since firm establishment.	Administrative registers
Share of women workers	Share of workers who are women.	Administrative registers
Share of immigrant workers	Share of workers who are first generation immigrants.	Administrative registers
Share of skilled workers	Share of workers with a college degree.	Administrative registers
Average years of education	Average years of education after primary school for all firm workers.	Administrative registers
Average age	Average age of all firm workers.	Administrative registers

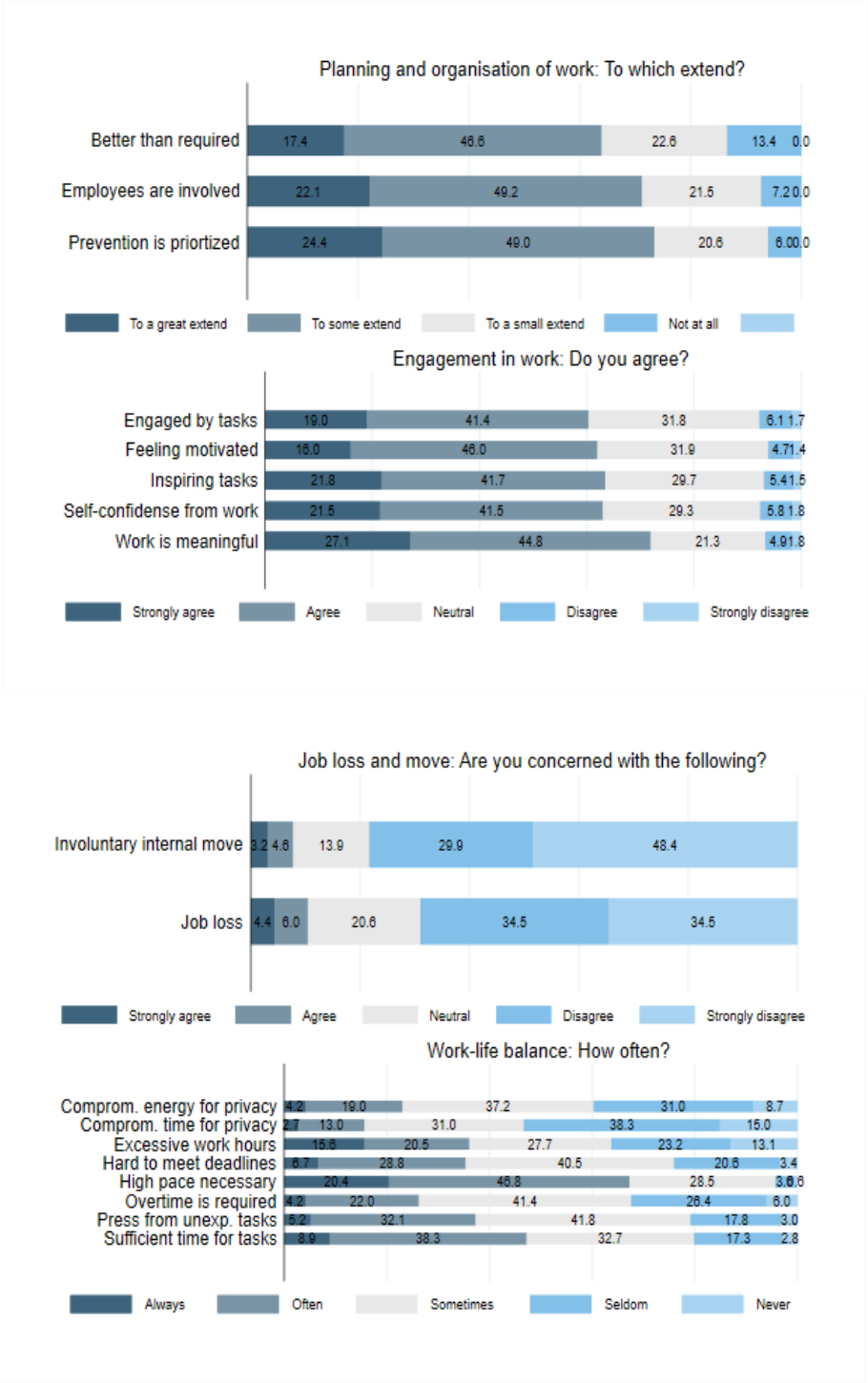
Table 3.10 Definition of variables (continued)

Variable	*Description*	*Source*
Firm characteristics		
All separations	Percentage of all firm workers who have separated from the firm by November 1st the following year. Retirements are excluded.	Administrative registers
Voluntary separations	Percentage of all firm workers who are registered in a new employment relation in another firm by November 1st the following year.	Administrative registers
Involuntary separations	Percentage of all firm workers who are registered unemployed by November 1st the following year. Retirements are excluded.	Administrative registers
Worker turnover	Percentage change in number of workers.	Administrative registers
Workers' average absence	Average paid hours of absence as a share of contracted hours for all firm workers. Paid hours of absence are absences in connection with own illness, children's illness, maternity leave, accident and other absences for which payment is made, including special holidays, children's holidays, care days, senior days and similar absences. The measure excludes parents with children younger than 18 years.	Administrative registers
Average basic hourly wage	Average hourly baseline wage for all firm workers.	Administrative registers
Average total hourly wage	Average basic hourly wage plus pension benefits, bonuses, overtime payments, and other benefits for all firm workers.	Administrative registers
Average pension	Average employer administrated pension contribution for all firm workers per hour worked. The measure includes worker pension contributions but only if administered by the employer.	Administrative registers

Table 3.10 Definition of variables (continued)

Variable	*Description*	*Source*
Firm characteristics		
Number of workplace accidents	Counts the total number of workplace accidents recorded by the Working Environment Authority. The number does not take into account severity nor type of accident.	Administrative registers
Workplace accidents severity	Counts the total number of workplace accidents by severity (6-levels). 1. only recorded by the Working Environment Authority (WEA) - no sick leave, 2. only recorded by WEA - sick leave, 3. recorded by WEA and the Labour Market Insurance (LMI) - no sick leave nor long-term damage, 4. recorded by WEA and LMI - no sick leave but long-term damage, 5. recorded by WEA and LMI - sick leave but no long-term damage, and 6. recorded by WEA and LMI - sick leave and long-term damage.	Administrative registers
Unionization degree	Share of workers who are members of an unemployment insurance fund. Unemployment insurance fund membership is used as a proxy for union membership.	Administrative registers
Family firm	Variable equal to 1 if 3 or more family members are involved in the firm, either as board director or CEO, and 0 otherwise.	Business authority and administrative registers

Figure 3.5: Distribution of answers from the work environment and health questionnaire



Notes: The panels plot responses from the questionnaire on workers' work environment and health carried out by the National Research Centre for the Working Environment 2016 with 38,000 worker respondents. All questions are simplified relative to the actual questionnaire. Numbers in the bars indicate the percentage of total.

Table 3.11: Design checks: continuity of covariates

	Number workers	Share women workers	Share immigrant workers	Share skilled workers	Union density	Firm age
	(1)	(2)	(3)	(4)	(5)	(6)
Above 35	2.503	0.032	0.008	0.002	0.010	0.382
	(1.539)	(0.021)	(0.008)	(0.012)	(0.011)	(1.456)
1-digit industry F.E.	✓	✓	✓	✓	✓	✓
Region F.E.	✓	✓	✓	✓	✓	✓
Control Mean	27.186	.264	.059	.068	.8	21.185
R^2	.311	.002	.004	.002	.01	.01
Observations	4099	3997	3997	3997	3997	4099

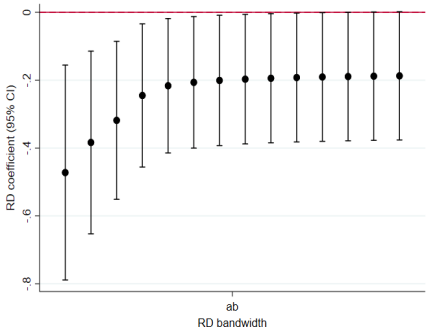
Notes: Regressions control for a full set of region and industry indicators. The sample is restricted as defined in section 3.4 to firms with between 16.8 and 53.2 workers which remained above or below the threshold of 35-workers in years t-1, t, and t+1. The sample is restricted to year 2015. All columns report estimates of the coefficient β from equation 3.1. t statistics in parentheses and significance levels are indicated as * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3.12: First-stage: effect of the regulation on worker representation, other outcomes

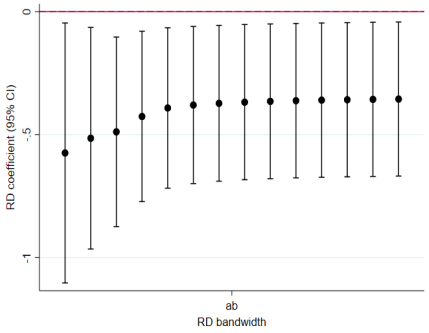
	Worker representation	Share workers-elected directors	Number workers-elected directors
	(1)	(2)	(3)
Above 35	0.051**	0.021**	0.130**
	(0.025)	(0.009)	(0.052)
1-digit industry F.E.	✓	✓	✓
Region F.E.	✓	✓	✓
Control Mean	.015	.005	.023
R^2	.069	.067	.079
Observations	3994	3994	3994

Notes: Regressions control for a full set of region and industry indicators. The sample is restricted as defined in section 3.4 to firms with between 16.8 and 53.2 workers which remained above or below the threshold of 35-workers in years t-1, t, and t+1. The sample is restricted to year 2015. All columns report estimates of the coefficient β from equation **??**. t statistics in parentheses and significane levels are indicated as * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

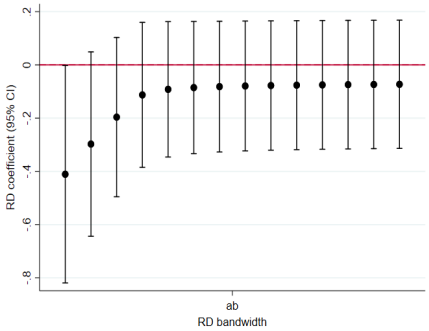
Figure 3.6: RDD bandwidth sensitivity graphs



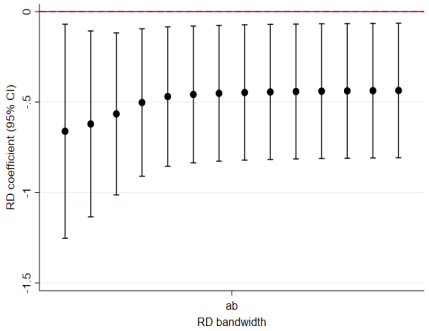
(a) Work engagement index (all firms)



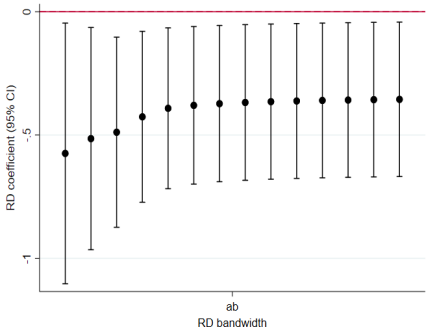
(b) Work engagement index (below median union density firms)



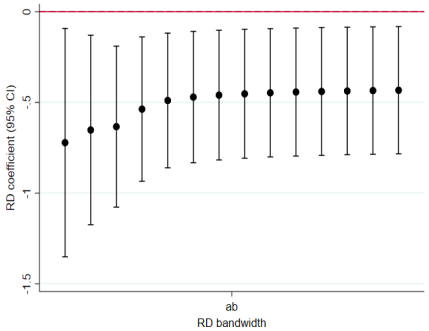
(c) Work engagement index (above median union density firms)



(d) Work is meaningful (below median union density firms)



(e) Feeling motivated (below median union density firms)



(f) Engaged by tasks (below median union density firms)

Notes: The figure plots the estimated β from equation 3.1 and 95% confidence intervals for different bandwidths. In all figures, bandwidths vary from 5 to 31 workers on each side of the 35 worker threshold and increases by 2 workers for each plot. All estimations control for a full set of region and industry fixed-effects and use triangular kernel weights. The figures display the corresponding baseline results from table 3.5 and 3.9.

Chapter 4

Participatory Practices and External Hires to Managerial Positions

Co-authored with Aleksandra Gregorič[1] and Takao Kato[2]

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Abstract

The paper aims to advance the understanding of the firm-specific factors that shape firms' preferences about filling managerial jobs through external hiring rather than internal promotions. With this purpose, we compare the recruitment strategies in the companies, whose board of directors includes worker representatives on the board of directors (that we use as a proxy for high participatory practices in the organization), and the recruitment strategies in other comparable firms without workers' representation on the board. We hypothesize that participatory practices (board-level worker representation, BLWR) increase the benefits of recruiting internally. workers' involvement in the firms' decision-making: 1) strengthens firm-specific human capital advantages of internal candidates, 2) improves the information flow about internal candidates to those in charge of the recruitment; and 3) increases firms' propensity to hazard external candidates in promotion tournaments, due to inequality concerns. We confirm our propositions on the relationship between board-level worker representation (BLWR) and the firm's propensity to recruit management talent externally, using a two-step FE model and the administrative employer-worker matched data for the population of Danish firms during 2001-2017.

4.1 Introduction

How do corporations recruit managerial talent? The strategies and practices that companies use to fill top positions have attracted a lot of attention in the economics, finance, and strategic management literature. Among others, scholars have studied what factors determine the selection of a specific person to top positions and dedicated significant attention to the biases in the selection, hiring, and promotion practices. Less is however known about how the firms combine the internal promotions, mobility, and external labor markets in filling the various positions (but see Bidwell and Keller (2014); Friedrich (2020)). Understanding this is important considering the noticeable increase in the external hiring to all levels of the organizations over the years (Bidwell and Keller, 2014; Frydman and Jenter, 2010).

Most importantly, scholars point to a significant job-level (Bidwell and Keller, 2014) and firm-level heterogeneity in the firms' reliance on external and internal labor markets in the recruitment to top positions, non-CEO positions in particular (Friedrich, 2020; Bidwell and Keller, 2014; Yang and Bidwell, 2017). We contribute to this literature by advancing the current understanding of the firm-specific factors that shape the firms' preferences concerning internal promotions (external recruitment). Specifically, we study whether the firms' preferences regarding the recruitment strategies to top positions vary with firm participatory practices, namely the involvement of firms' workers in the firms' decision-making (i.e., board-level worker representation, BLWR).

Theorizing on the firms' strategies concerning recruitment to top positions requires

an understanding of the factors that affect the firms' preferences and capabilities to hire externally (promote internally). The extant literature offers several insights on the aspects that might affect how firms fill their (top) positions. Specifically, work on recruitment to CEO and non-CEO positions has previously linked the firms' choices between internal promotions and external labor market hiring to the accessibility of signals on the candidates' qualifications, and the firms' expertise in detecting these signals, attracting and socializing the new hires. Firms' propensity to hire internally might also depend on the relevance of firm-specific human capital (Becker, 1964), and the need to stimulate effort and the development of managerial talent through internal labour markets and tournaments (Bidwell and Keller, 2014; Chan et al., 1996; DeVaro et al., 2019; DeVaro and Morita, 2013; Frederiksen and Kato, 2011; Vinkenburg et al., 2011).

Drawing on these three factors (information, firm-specific human capital, and motivation), and the literature on workers' participation in firms' decisions making, we hypothesize why, ceteris paribus, the propensity for external hires (rather than internal promotions) is likely lower in firms with board-level worker representation (BLWR) compared with the conventional shareholder-oriented, low participatory firms. Specifically, we argue that the opportunities for an evaluation of the internal candidates are superior in BLWR firms, as in these firms the workers' representatives on the board (and supporting institutions, such as works councils and unions) provide for better information exchange across the various (higher) levels of the organization (e.g., Freeman and Lazear (1994)). BLWR also increases the importance of firm-specific knowledge accumulated by the internal candidates, particularly their understanding of the shared-governance norms and culture. The

workers' participation in the firms' strategic decisions also offers a stronger reassurance to the contracts between the firm and its workers, thereby reinforcing the creation of firm-specific human capital in internal labour markets (Wells et al., 1991; Zeitoun et al., 2014). Finally, drawing on the literature on the workers' attitudes towards inequality (Barth et al., 2012; Card et al., 2018; Chan et al., 1996))[3], we hypothesize that the firms with participatory practices (BLWR) might be more inclined to 'hazard' the external candidates in order to motivate the effort of internal candidates, without increasing the size of the tournament rewards.

We test our hypothesis and the proposed economic channels using the administrative employer-worker matched data for the population of Danish firms during 2001-2017. We focus on the recruitment of individuals to all managerial positions and investigate, whether companies with board-level worker representation (BLWR), as a proxy for higher participatory practices in the organizations, are less likely to fill managerial positions through external labour market hiring. Since the board-level participation does not vary significantly in time, we estimate this relation by using a two-step fixed effect method as in Friedrich (2020), while including a large set of controls in order to mitigate endogeneity concerns. Comparing the firms with board-level worker representation (BLWR firms) and firms without board-level worker representation (conventional firms), we find that the former are on average less likely to recruit their top-level workers through external labour markets. These results are statistically and economically significant, and robust

[3]Chan et al. (1996) for example examine the strategies for internal promotions and external recruitment and how this affects candidates' incentives. Opening up for hiring of external candidates somewhat erodes internal candidates' incentive to work as the changes of promotion are reduced. While this strategy may motivate internal candidates, external candidates may be discouraged because of uneven competition.

to various model specifications, definitions of the main and explanatory variables, and different sets of controls.

We corroborate our conclusions by comparing the internally and externally recruited individuals in BLWR firms and conventional shareholders (non-BLWR) firms. Specifically, while a stronger inclination of BLWR firms to recruit internally might reflect their stronger preference and ability to recruit internally, as hypothesized in this paper, one could argue that the higher propensity of the BLWR firms to recruit internally is due to the fact that these firms overall find it harder to attract individuals on the external markets. In line with our initial hypotheses, and contrary to this alternative explanation, we show that the lower external recruitment in BLWR firms is not due to the constraints on the external labour market. When recruiting externally, the BLWR firms do not need to pay the hired individuals more than other firms do. Moreover, the quality of the individuals recruited externally is similar in the BLWR and conventional firms.

Our paper contributes to the recent stream of literature investigating the impact of organizational characteristics on the firms' hiring strategies, focusing specifically on the recruitment of managerial talent. Understanding what factors increase the firms' motivation to recruit internally rather than externally is important in the light of the empirical evidence on the importance of internal promotion for the attraction and maintenance of talent within the company (Yang and Bidwell, 2017). We also contribute to the literature on corporate governance and, particularly the work discussing the implications of worker participation in the firm's decision making (for a review, see Gregorič (2022)) by theoretically conceptualizing and empirically verifying a novel channel through which BLWR affects firm behaviour

and performance. Our study also contributes to the literature on talent recruitment and internal labour markets, by investigating the relationship between BLWR, internal labour markets, and the composition of the organizational upper echelons.

4.2 Theoretical Framework

In filling a new managerial position[4], a firm can either rely on internal mobility (promotions and lateral transfers) or hire someone externally (Bidwell and Keller, 2014; Agrawal et al., 2006). Most of the studies in this field look at the firms' choices about how to recruit their chief executive officer (CEO). Theoretical and empirical work in this field points to the information asymmetries in internal promotions and external hiring, the availability of qualified internal candidates, and the firm-specific human capital as the key factors driving the firms toward hiring the 'better known" or "more suitable" internal candidate (e.g., Agrawal et al. (2006); Chan et al. (1996)). More recently, a few studies using detailed organizational data investigate firms' hiring choices at lower (non-CEO) organizational levels. Contrary to the high predominance of internal hires for CEO-related positions (Agrawal et al., 2006), these studies show that externally recruited individuals often constitute a significant share (if not a majority) of those recruited to high-level positions in organizations. Most importantly, scholars underscore significant firm-level heterogeneity in the share of externally (internally) recruited individuals to these positions (Bidwell and Keller, 2014; Friedrich, 2020). This evidence creates room for

[4]We only consider positions that are not filled by lateral transfers and compare external hires and promotions of internal candidates employed at lower level positions. We address eventual limitations due to the exclusion of lateral transfer in the robustness section.

further analyses of the factors that might shape firms' recruitment strategies.

Theoretically, the mechanisms that explain the firms' choices about CEO positions can be applied to study firms' decisions about external hires and internal promotions at the lower organizational levels (e.g., Bidwell and Keller (2014)). This literature puts forward three main explanations for why the firms might prefer to fill the top-level organizational positions through internal promotions rather than recruit externally. We refer to these mechanisms as the information, human capital, and motivation mechanism. Firstly, internal candidates might be preferred to external candidates in cases, where these candidates are comparably better or whose suitability to a specific position can be evaluated better, compared to the one of external candidates. As for the case of CEO selection, the hiring to management positions more broadly is likely hampered by high information asymmetries in the search process. Job requirements at high-level positions are hard to predefine. Those in managerial positions often face uncertainties and need to balance between the various competing demands, as well as deal with uncertainties, and highly competitive environments that often require one's ability to manage high-level anxiety and stress (Siegel and Hambrick, 2005; Janssen, 2001). With regard to one's ability to manage these conditions, the internal candidates might be better able—compared with the external ones—to signal their capabilities and their fit for the open managerial positions. Frederiksen and Kato (2011), for example, show that internal labour market and organizational characteristics in certain firms motivate the revelation of individual characteristics that are generally unobserved when recruiting externally. Secondly, firms will prefer to recruit internally in cases, where managerial positions strongly draw on firm-specific managerial human cap-

ital, making the internal candidates, who have acquired firm-specific knowledge by working in the firm better candidates for managerial positions (Agrawal et al., 2006; Bidwell and Keller, 2014; Frederiksen and Kato, 2011). The preference to recruit internally would therefore depend on how idiosyncratic the hiring firm is relative to other firms, and thus on the importance of firm-specific human capital for the managers' contribution to the company[5].

Thirdly, firms might prefer to hire internally rather than to promote externally, because the opportunities for promotion to top-level positions and the resulting increase in wages, provide an incentive for the lower level workers to work harder (Agrawal et al., 2006; Chan et al., 1996; Lazear, 1981; Eriksson, 1999). Particularly in the cases where the absolute performance of individual workers is hard to observe and/or the use of incentive pay is limited, companies can motivate their workers to work harder by creating a tournament. In a tournament, one's relative performance vis-à-vis the co-workers determines the probability of winning the tournament, where the price is a promotion to a higher paid position. The higher the increase in the wage (following a promotion) and the higher one's chance of being promoted (i.e., winning the tournament), the higher is the insiders' motivation and increase in effort. To increase the motivational effect of promotions, a firm could therefore either increase the wage rise following the promotion (the price of tournament), or increase the probability for insiders to win the tournament by 'handicapping' external candidates (Agrawal et al., 2006; Lazear, 1981; DeVaro and Morita, 2013; DeVaro, 2006; Lazear, 2000).

[5]Frederiksen and Kato (2011) also find support for the importance of human capital showing that, while both, the number of positions held internal and external the firm is positively associated with the probability of being hired in a top-executive position, especially positions held internal the firm matters.

These arguments closely relate to the literature on deferred compensation in the organizations, as studies find that the steepest wage increases during one's tenure result from promotions, particularly those near the organizational top (Lazear, 2018; Belzil and Bognanno, 2010). Work on deferred compensation links workers' motivation to work hard to explicit or implicit longer-term agreements between the firm and its workers, where firms create incentives for workers to commit high effort by underpaying workers in the first years of employment and overpaying during later years (Lazear, 1979, 1981; Wachter and Wright, 1990; Pfeffer and Cohen, 1984). The worker posts bond in the early stage of her career within the firm by agreeing to be underpaid in her early years with the firm; the firm will return the posted bond by overpaying her in her later years with the firm. By making the tenure-wage profiles sufficiently steep (in other words, making the bond sufficiently large), and combining it with a termination contract, where the firm fires the workers that are caught shirking, the firm can eliminate the worker's incentive to shirk. However, this arrangement is not incentive compatible since the firm has an incentive to renege on a termination contract by firing the worker as soon as she completes her post bonding even if she does not shirk. Having realized this incentive incompatibility, no worker will volunteer to enter this arrangement. Typically, under a repeated game setting, when the firm cares about its reputation, the incentive incompatibility is solved, and the worker will willingly enter the termination contract with the upward-sloping tenure wage profile (Lazear, 1979, 1981). A firm's preference for hiring internally rather than recruiting externally might be therefore complementary to the firm's need to provide incentives through internal labour markets (Belzil and Bognanno, 2010; Lazear, 2018).

4.3 Board-level worker representation and external hires

We combine the literature on internal labour markets (outlined above) and on workers' participation in the firms' decision-making (see Gregorič (2022); Harju et al. (2021) for review) to propose that the firms' tendency to recruit management talent externally rather than promote internally depends on firms' participatory practices (the highest level consisting of workers' participation in the board of directors). We argue that workers' participation in firms' strategic decisions reduces firms' preferences to hire externally, leading to a higher propensity for these firms to recruit through internal promotions. This is because high-level participatory practices, such as the board-level worker representation (BLWR),: 1) affect the comparability of internal and external candidates to the benefit of internal promotions (Agrawal et al., 2006); and 2) strengthen the firms' reliance on internal promotion opportunities as a motivation mechanism.

Firstly, we argue that the presence of worker directors on board increases the relevance of firm-specific managerial human capital in managerial jobs, particularly the managers' understanding of the participatory norms and culture. In a conventional shareholder-oriented firm, the corporate governance system assigns priority to shareholder interests above all others. The shareholder-elected directors generally delegate the actual job of running the firm to a hierarchy of workers headed by the chief executive officer (CEO) recruited by the board directors. In the firms with worker directors, the CEO is recruited by a board composed of both shareholder and worker-elected directors, and this arguably changes not only the formal accountability of the CEO but also the norms and cultures that the CEO and the

managers below the CEO have to operate in. The ability to understand and handle the relations with the workers within a specific firm might be particularly relevant for managerial personnel, considering that these top-level workers probably play an important role in 'translating' the strategic policies, designed at the board level, through the organization (e.g., Freeman and Lazear (1994)). Moreover, workers' participation in the firms' strategic decision-making makes the firms internalize workers' interests in their decisions, thereby offering a stronger reassurance to the contracts between the firm and its workers (Wells et al., 1991; Zeitoun et al., 2014), and thus increasing the efficiency of internal labour markets in boosting the firm-specific investments by workers. Having a voice in the firm governance also increases workers' commitment to the firm, their mutual monitoring, cooperation, and vertical information sharing. These reinforce the benefits of the internal labour market, as they decrease the costs of hiring and training (Sadowski et al., 2000; Addison, 2009; Jäger et al., 2021) while increasing the quality of the internal candidates for the top positions.

Secondly, the BLWR further affects the comparability between internal and external candidates because it, at a given level of information about external candidates, reduces the information asymmetry between the firm (those recruiting to managerial positions) and the internal candidates for these positions. When workers are formally represented on the board of directors with a voting mandate, information flows on qualified internal candidates to top-managerial positions are enhanced (Freeman and Lazear, 1994). While the board of directors is only in charge of hiring the firm CEO, we do not believe the enhanced information flows on internal candidates are only enhanced for CEO candidates nor that it only affects the hiring

of firm CEOs. Because workers actively decide to be represented formally in the board of directors, we argue that participatory practices generally are stronger in this group of firms and that workers are more likely represented at more levels of the firm organisation including the cooperation committee. As a result, information flows on internal candidates are enhanced on all levels of the organisation and in turn affect hiring of not only the CEO but the general managerial team as well. Assuming that the employers can commit not to extract the full gain of information from workers, the information provided by the workers will be credible (Freeman and Lazear, 1994).

Thirdly, the companies with worker representation should be more inclined to rely on promotions as these companies are likely more concerned about wage inequality (and significant performance-related rewards) and impose stronger limitations on wage increases, following a promotion, compared to the firms without worker directors on board. It implies from the tournament theory that the use of tournaments (promotions in the organization) might act as a substitute for the use of performance-related rewards to workers, but also that the efficiency of tournaments in providing motivation to workers will decrease as the pool of candidates for internal promotions increases (Agrawal et al., 2006; Chan et al., 1996)[6]. The firm can compensate for the increase in the candidates by increasing the wage rewarded to those promoted to the higher-level positions. Thus, keeping the workers' motivation constant while increasing the pool of candidates to include external

[6]Opening up for hiring of external candidates erode to some extent internal candidates' incentive to work as the changes of promotion are reduced. While this strategy may motivate internal candidates, external candidates may be discouraged because of uneven competition. The paper by Chan et al. (1996) also stresses the importance of the number and quality of internal candidates for the choice between internal and external contestants.

candidates for top positions would require either 1) an increase in wage inequality among the workers working at the same level of job positions; or 2) an increase in the wage differences between the workers working at the managerial level positions and their subordinates.

Drawing on the literature on worker board representation, we hypothesize that the firms' preferences towards such wage differences (both horizontally and vertically) decrease as worker directors join the board. Worker directors, similarly to utilitarian unions, represent the risk-averse workers. Risk-aversion implies that more weight is put on low pay than on high pay, providing collective preferences that favour pay equality. Accordingly, studies find that the pay-for-performance associates with lower wage inequality in the unionized firms compared with the non-unionized ones (Barth et al., 2012). In shareholder-oriented (non-BLWR) firms, the reliance on performance-related pay and resulting higher wage inequalities are likely to be considered more justified and efficient compared with the firms managed under stakeholder logics (Barth et al., 2012). Therefore, in order to maintain motivation at moderate levels of tournament prices (and wage inequality), the firms with BLWR are probably more likely to hazard the external candidates in order to increase promotion probabilities (and thus effort) of internal candidates in the organization. In sum, we hypothesize that the preferences to fill the managerial positions by external hires are likely to be smaller in the firms with board-level worker representation (BLWR) compared with the firms operating in conventional shareholder-governance model and low participatory practices.

4.4 Empirical Analysis

4.4.1 Data and Summary Statistics

We test our hypothesis and the proposed economic channels using the administrative employer-worker matched data for the population of Danish firms during 2001-2017. For the purpose of the analysis, we merged firm-level information (e.g., number of workers, financial information, organizational form, value-added, industry, etc.) with the employment information from the administrative registers from Statistics Denmark (IDA). We combine this data with the information on the composition of the board of directors (supervisory boards[7]) from the Danish Business Authority. Data on the board of directors contains information about whether worker directors are present on the supervisory board, and whether the members of the board are family related (the latter captures family-controlled firms). In Denmark, workers have the right (but not the obligation) to elect their representatives to the board of directors. This right applies to companies that have employed (over a 3-year period) on average 35 full-time workers. The right can be exercised if demanded by at least 10 percent of workers in the firm; by a majority of the members of the corporation committee, or a union if representing at least 10 percent of the workers.

Our starting dataset includes the population of all Danish corporations (joint stock

[7]The Danish joint stock companies (public and private limited firms) mostly operate under the two ties board system. In this system, the board of directors is formally separated from the management board and is referred to as the firm's supervisory board. If decided so by the shareholders, one member of the management team only, normally the CEO, can also be part of the board of directors.

companies AS, limited liability firms ApS and other types of organizations). For the purpose of the analysis, we restrict the population of these firms to a sample of firms that fulfil the following conditions: 1) they had a board of directors (supervisory board) in place during 2001-2017 and 2) they employed on average 35 workers during each of the years during the period 2001-2017. The latter restriction narrows our sample down to firms that are subject to the legislation regulating workers' board representation. We end up with a sample of 4,608 companies. Among the firms in our sample, about 50 percent of the firms have been present in the sample for at least 8 years (out of a total of 17 years) and nearly 30 percent of these firms have been present in the sample for the entire period of analysis. These firms on average employ about 23 percent of all Danish workers (working in more than 142,000 firms in total) and slightly below 30 percent of all Danish workers employed at the managerial level. This restriction therefore also improves the sample in terms of the information available for the period of analysis; 56% of firms in the initial population have been present for less than 3 years during the 17-year period of our analysis. The share of such firms (with less than 3 years in operation) in the final sample is below 30 percent; more than 50% of the firms in the final sample are observed for more than 8 years and nearly 30 percent during the entire period of analysis (17 years).

For the purpose of the two-step FE model estimation (and following Friedrich (2020)), we further restrict the sample to include only the companies that have had at least 10 new hires to managerial positions during the 2001-2017 period. We also exclude the firms operating in the utilities sector and, in the final analysis, further restrain the sample to joint stock companies, as for these firms only it is mandatory

to have a board of directors. We end up with a final sample of 1688 unique companies employing 89,474 unique management workers[8] during the 2001-2017 period. About 40 percent of these firms have worker-elected members on their boards of directors. In the firms with BLWR, worker directors hold (on average) 38 percent of all supervisory board seats.

Table 4.1 reports the descriptive statistics for the top managerial hires in our sample firms. The hires refer to new externally recruited or internally promoted individuals to top-level managerial level positions. The individuals working in these positions constitute about 5 percent of all individuals working in the sample firms, on average. As indicated in Table 4.1, the average firm in our sample employs around 369 workers. The firms have been in the sample for 14 years, on average, and have appointed new managerial personnel in nine of those years, on average. During the entire period of analysis, these firms have appointed 50 new individuals to managerial positions, on average. In the final analysis, we exclude new hires that result from mergers and acquisitions; when excluding these, the number of newly hired managerial workers in the period declines only slightly (compare N new managerial and N new managerial1). Table 4.2 presents the summary statistics for the percentage of managerial workers that are recruited from the external labour market ($Exter$%; $Exter_1$% for appointments outside the firm and other firms within the same business group). Panel A shows the numbers for the entire sample, panel B for the firms with board-level worker representation, and panel C for those without board-level worker representation. The classification of the firms

[8]Management level is defined as both c-suite members and top managers (labeled as 31 according to the Danish classification of job positions)

into the BLWR and non-BLWR subsamples is based on a dummy that classifies a firm as a BLWR firm when the firm has had worker directors on board for at least half of the period during the which the firm is observed in our data. More than 63 percent of the newly appointed managerial personnel is recruited through the external labour market rather than being promoted internally (see $Exter_1\%$), for example). About 1 percent of managerial workers are recruited from among those working in other companies within the firms' business group (compare $Exter\%$ and $Exter_1\%$). In the analysis, we mostly consider as external those external appointments that are external to the company and other firms within the business groups, although the results are robust to using the alternative definition, in which hires from other firms in the business groups are also considered as external hires.

In Table 4.2, we also look at the percentage of externally and internally hired for the five highest paid workers in the firm, ($Exter5\%$; $Exter_15\%$; where the rank is defined using the basic hourly wage, thereby excluding performance-based payments and other perks). The share of externally hired among the top five is about 3-5 percentage points lower compared to all managerial workers. This is in line with the previous literature, which documents strong firms' preferences to select the top-level workers, CEO in particular, internally.

Comparing companies with worker board representation (BLWR firms) and those without worker board representation (non-BLWR firms), we find that BLWR firms overall recruit a significantly lower percentage of managerial staff on the external labour market. For example, slightly more than 60 percent of managerial workers in BLWR firms is recruited externally; the incidence of these recruitments is by 5 percentage points (8 percent) higher in the firms without BLWR.

Complementing Table 4.1, we present the Kernel density diagram for the share of externally hired managers in all firms (Figure 4.1), and then separately for the BLWR and non-BLWR firms. As shown in the figures, there is a significant heterogeneity in the percentage of externally hired workers across firms, although (on average) these percentages are higher in BLWR firms. The difference between BLWR and non-BLWR firms seems to be higher when considering all managerial recruitments, not only the top five workers. In the continuation, we focus of our analysis will be therefore on all top-managerial level workers, although we consider the rank of those recruited in the individual-level analyses, i.e. two-stage FE regression models, see below).

– Insert Table 4.1 and Table 4.2 here –

– Insert Figure 4.1 here –

4.4.2 Results

The aim of our analysis is to investigate whether participatory practices (that we capture by board-level worker representation, BLWR) ceteris paribus imply a lower firm propensity to hire externally rather than recruit them through internal promotions. Theoretically, we conceptualized this relationship by drawing on the literature on internal labour markets and the firms' reliance on long-term contracts that link wage increases to workers' tenure in the firm, and the firms' reliance on tournaments as mechanisms motivating higher workers' effort and firm-specific investments in human capital. To verify our basic theoretical framework, we therefore show the results of a basic pooled OLS regression, where we relate the firms'

propensity to hire externally (captured by the % of externally hired managerial workers1 in a given year) to a number of firm characteristics that reflect the characteristics of the firms' internal labour markets. This percentage considers as externally hired only those that are hired and have not (in the year prior to being hired) worker in the firm or other firms within the same business group. Following our theoretical framework, we would expect that the firms' propensity to recruit externally (rather than promoting internally) is lower in larger firms. The pool of potential candidates for managerial positions is probably less numerous in smaller firms compared to the larger firms. The larger firms are likely better able to invest resources in the workers' training, and in the selection and mentoring of candidates with management potential. The propensity to recruit externally might be also lower in firms that rely more strongly on firm-specific human capital, or/and use wage increases and internal promotions to prevent shrinking.

We tabulate the results of the basic pooled OLS model in Table 4.3. In model (1), the table reports the OLS estimates of a regression relating the percent of externally appointed managers (as % of all newly appointed managerial workers) to a number of firm characteristics. All models include the sector-time fixed effects and the region-time fixed effects; we cluster the standard errors at the firm level. In line with theoretical arguments, we see that larger firms and firms that are part of the business group (with a higher number of firms in the group) are less likely to recruit their managerial personnel externally. A stronger reliance on the internal labour markets by firms that are part of the business group is in line with what previously observed in the literature (Cestone et al., 2016). Family firms are more likely to hire their workers externally compared to other companies, on average,

although the coefficient is not statistically significant across the various specifications (see other models in Table 4.1). In model (2) of Table 4.3, we add our BLWR dummy; the dummy is set the value 1 if the firm has at least one worker-elected director on board at time (t) and zero otherwise. As indicated in Table 4.3, model (2), the percentage of externally recruited managers in the firms with BLWR is about 2.5 percentage points (about 4 percent) lower compared to the one in the firms without BLWR.

In model (3), Table 4.3, we add a number of other firm-specific characteristics that might affect the firms' propensity to hire externally and reflect the characteristics of the firms' internal labour markets. We control for the percentage of newly hired managers relative to the number of workers (NewA(%empl)), as a proxy for the demand for managerial talent in the firm. We include a variable measuring the percentage of workers exiting the firm in year (t) and the percentage of turnover, in order to capture workers' mobility across the organizations. The signs of the coefficients for these variables are in line with theoretical predictions, suggesting, for example, that the firms with a large internal pool of potential candidates for top-level positions and those with lower turnover are on average less likely to recruit externally. Adding these additional variables to the regressions reinforces the negative relationship between BLWR and firms' propensity to hire their managers externally.

– Insert Table 4.3 here –

To capture the relevance of internal labour markets more directly, as well as to account for the relevance of firm-specific human capital (Becker, 1964), we in model

(4) include the firm-level earnings-tenure slopes[9]. In the literature, both of these firms-specific aspects have been captured by the size of the wage-tenure slope (e.g., Lazear (2000); Jones et al. (2007)). To estimate the firm-level earnings-tenure slope, we run a log-wage regression with individual worker's firm-tenure and tenure-squared and other firm- and individual level controls generally used in the literature, and all workers employed in our sample firms during 2000-2017. The beta coefficient on tenure and tenure squared are allowed to vary by firm (that is, we estimate period-level beta coefficients on tenure and tenure-squared) and can be interpreted as the firm-specific earnings-tenure and earnings-tenure squared slope during the period of our analysis[10]. We observe that a higher wage-tenure (Slope basic) and wage-tenure squared (Slope squared) slopes correlate with on average a lower share of externally recruited managerial workers, on average. Again, including wage-tenure slopes does not decrease the impact of BLWR on firms' propensity to hire externally; on the contrary, the coefficient increases in absolute terms. This result decreases the concern about BLWR dummy simply reflecting a stronger firms' reliance on deferred wages and, alternatively, a higher relevance of firm-specific investments in the firms with board-level worker representation (see Gregorič and Rapp (2019)). Economically, the size of the BLWR coefficient is not negligible. On average, the share of managerial workers recruited externally is about 3.5 percentage points lower in the companies with BLWR compared with

[9]In the literature, the firms' reliance on these implicit and explicit long-term agreements (internal labor markets) has been empirically verified through analysis of the earnings-tenure profiles in the organizations (e.g.,Jones et al. (2007)). However, the upward earnings-tenure slopes have been also associated to the firm-specific human capital theory, as scholars use tenure as a proxy of the human capital accumulation through on-job training etc., which likely improves a worker's productivity and consequently should lead t higher wages (Hashimoto, 1981; Jones et al., 2007)

[10]The sample consists of 2.5m firm-year observations for 400k unique firms.

other firms. The results are robust to using the share of worker directors on board (BLWR percent) at the place of the BLWR dummy (see Table 4.4).

– Insert Table 4.4 here –

In Tables 4.3 and 4.4, the BLWR variable measures worker representation on the boards of companies at time (t). Although this variable varies in time, some of this variability might be simply capturing the delays in the appointment of worker directors (dFue to which a firm might have worker directors in year (t-1) but not in year (t)), and thus cannot be exploited for identification purposes. Moreover, we are theoretically interested in the long-term effects of BLWR on the firms' preferences for external recruitment, rather than temporary deviations due to yearly changes in the composition of the board. That is, we want to estimate the extent to which BLWR can explain the firm-specific time-invariant differences in the hiring policies over the 2001-2017 period. With this purpose, we follow Friedrich (2020) and estimate a two-step model[11] using the information for all new appointments to managerial positions during 2002-2017. In the first stage, we estimate a linear probability model with firm fixed effects, region-year, and sector-year dummies, namely

$$EXApp_{ijt} = \beta J_{it} + \gamma Z_{it} + u_j + ur_t + us_t + v_{ijt} \tag{4.1}$$

Where $EXApp_{ijt}$ is a binary variable that takes a value of 1 if the managerial position i at firm j at time t is filed by an external hire, and 0 if the position has been

[11]The linear probability model is a linear approximation of a Probit(Logit) model (that would normally apply to regression models with the indicator variable as the dependent variable) that works well in the case where the frequency of external hiring is around 50% (e.g., Friedrich (2020)).

filled by internal promotion. J_{it} refers to job-related characteristics (rank of the position). The Z_{it} are time-variant firm characteristics such as total employment, sales and assets (at $t-1$), value-added per worker (Friedrich, 2020), number of firms in the group. We also include a number of firm-specific characteristics capturing firms' internal labour markets (percentage of newly hired managers; percentage of exits in the year; percentage of individuals working on positions just below top-level managerial posts), as well as a dummy for family controlled firms. This first-stage regression also includes region-time effects ur_t, and sector-time effects us_t. We report the first-stage results in Table 4.5. We consider two different dependent variables, one capturing all recruitments external to the firm ($EXApp$) and one capturing only recruitments that are outside the firms' business groups ($EXApp_1$). The analysis follows closely the paper by Friedrich (2020), although we include some additional control variables to capture changes in the firm demands for new hires and the potential restrains in the availability of internal candidates. Similarly, to previously reported evidence (Friedrich, 2020), we observe substantial dispersion in the firms' hiring strategies within a sector, captured by the firm fixed effects' estimates. We draw on various methods from the literature on teacher value-added such as shrinkage and a two-step procedure as in Chetty et al. (2014) to account for sampling error and estimate the standard deviation of firm fixed effects in the range between 0.24-0.26.

– Insert Table 4.5 here –

In the second stage, we regress the firm fixed effect $\hat{u}_j$ (obtain from the first stage regression reported in Table 4.5) on an alternative set of variables capturing the presence of worker directors on the board of the firm, 2002-2017 period, namely

$$\hat{u}_j = \theta BLWR_j + \epsilon_j \tag{4.2}$$

The BLWR is measured in three different ways, to ensure the robustness of the results. That is, we capture high participatory practices in the organization by 1) as a dummy for the presence of BLWR during more than half of the entire period that a firm remains in our sample (Table 4.6); 2) a ratio capturing the share of years during which BLWR is present on the firm's board (Table 4.7); and 3) the average (unweighted) percent of worker directors on the firms' board during the period (Table 4.8). This second stage also includes the sector and regional dummies, and a variable capturing (again) the firm's average size during the period (number of workers, in logarithms) and, average firms' age, value added per worker (average for the period), a dummy for family control, and the firm-specific period earnings-tenure slopes. The models within each table (Table 4.6-4.8) vary depending on the number of additional controls included in the second stage regression. We include the listed variables in the second stage for various reasons. Some of them are included in the second stage because we are interested in their equilibrium effects (e.g., firm age, earnings-tenure slope) and because by definition they do not vary in time (e.g., earnings-tenure slopes). We re-introduce certain variables in the second stage also to further account for the potential endogeneity problem deriving from a possible relationship between BLWR and selected firm-level characteristics (e.g., value-added per worker; firm size; family control). We use unweighted period-level values for these variables as control. Table 4.2 (panel A-C) in the appendix replicates the results of Tables 4.6-4.8, while using the weighted averages of the control variables. Our second stage specifications again include more controls

compared to, for example, Friedrich (2020) as we want to make sure to include all the variables that might potentially correlate with BLWR. Our results are robust to using exactly the same specification as Friedrich (2020). We show the results for firm FE related to the $EXApp_1$, although the results are broadly robust to using the alternative definition of the dependent variable (which considers those recruited from other firms within the same business group as internally promoted).

– Insert Table 4.6-4.8 here –

The key variables of interest in Tables 4.6-4.8 are the variables capturing high participatory practices or, specifically, the presence of worker-elected directors on firm boards. The coefficients for BLWR (regardless of the measure adopted or controls added to the regressions in Table 4.6-4.8) confirm a negative statistically significant correlation between the high participatory practices and the firms' inclination to recruit managerial workers externally. These results are mostly robust across the different specifications, and in line with our theoretical arguments and with what is reported in Table 4.3. That is, the companies with high participatory practices are ceteris paribus less inclined to hire externally than to promote their managerial workers internally. The negative relationship remains when controlling for the firms' overall reliance on the internal labour markets (through, for example, the earnings-tenure slopes as covariates).

We also observe some interesting results concerning the control variables. We find that family firms have a stronger propensity to recruit externally. In line with Friedrich (2020) we find that the firms with a higher value-added are on average more likely to recruit externally, although the results are not significant across all specifications. In line with the internal labour market hypothesis, the wage tenure

slope negatively associates with the firms' propensity to recruit externally; in most specifications, the coefficient for the wage-tenure are negative and statistically significant. The impact of firm size in the second stage is positive. However, recall that have already substantially accounted for the firm size in the first-stage, by including three different measures of firm size, namely the total number of workers, firm sales, and total assets. Keeping this in mind, the observe result might be reflecting a higher pool of external candidates that large firms might be able to attract compared to smaller firms.

4.4.3 A further look at the economic channels

The results presented thus far are in line with our hypothesis that firms with higher participatory practices (BLWR firms) are less likely to hire externally, compared with other firms. Theoretically, we attributed this relationship to a stronger preference of BLWR firms for internal promotions. This preference translates into the firm's hiring strategies beyond the levels that reflect the characteristics of the employment relations in the firm, such as the firm-specific human capital. We captured these characteristics in our regressions by including the firm-specific earnings-tenure slopes in our second stage regressions. The coefficient for BLWR remains negative and statistically significant even after controlling for the earnings-tenure slope and a number of other firm-specific characteristics. An alternative explanation for the observed negative relationship between the BLWR and external recruitment might be that, rather than preferring to hire internally, the BLWR firms find it harder to recruit externally to top positions. That is, the higher likelihood of BLWR firms to recruit internally might be the result of the constraints that these firms face

when recruiting externally, rather than a preference for internal promotion. These constraints might be due to, for example, the anticipated stronger wage compression in the BLWR firms compared to other firms. If such constraints exist, we expect that, on average, the BLWR firms have access to poorer external candidates and end up recruiting candidates of lower ability (overall, or that they need to pay more for attracting candidates of the same quality as the non-BLWR firms. To investigate the alternative explanation, we first calculate basic summary statistics, comparing the individual's ability and wages of externally recruited candidates in the BLWR and non-BLWR firms. To compare the candidates' ability, we estimate the unobserved individual ability by relying on the time-invariant individual effects in a log-wage regression following Abowd et al. (1999), with fourth-order polynomials in experience and age, second-order polynomial in firm-tenure for all individuals employed at managerial positions at some point from 2000 to 2017[12]. This way, we estimate a time-invariant ability measure for managers for the career span observed in this time window. We report the summary statistics in Table 4.9.

– Insert Table 4.9 here –

The summary statistics reported in Table 4.9 provide no support to the alternative explanation about BLWR firms finding it harder to recruit good candidates externally. We observe that, while less likely to hire externally, the external recruitments in BLWR firms overall associates with individuals with overall higher ability compared with non-BLWR firms. We also find that, when recruiting externally, the

[12]From a sample of 4.4m unique individuals working in Danish firms, we limit the sample to 300k workers who at some point from 2000-2017 are employed as managers. The final sample consists of 1m job-spells. The measure for unobserved ability is normalized so that the mean of all fixed effects is zero.

BLWR firms are more likely to recruit individuals that already work on a managerial position in another organization, and thus already have some expertise in management. To the contrary, the average ability of those promoted internally is lower in BLWR firms compared to non-BLWR firms. These descriptive statistics are in line with the hypothesized preference of BLWR firms to promote internally rather than externally. While providing suggestive evidence, the tabulated differences numbers might however capture, for example, a different distribution in the rank of those hired by BLWR and non-BLWR firms, as well as other differences in the characteristics of BLWR and non-BLWR firms. To investigate this further, we estimate the two-step FE model (see above for description) in order to analyse whether, on average, those externally recruited to BLWR firms are on average paid more (less) and have higher (lower) ability compared to those externally hired in non-BLWR firms.

With regards to the wage increases, we estimate two different models, one using the difference in the basic annual wage for the externally hired individual (once hired to the new position), and one using the change in the total hourly wage as the dependent variable. In the first stage of these analyses, we control for individuals' rank (in the new position), individual's ability, a dummy for whether the individual was previously employed in the same position, and a number of other firm characteristics included in our preceding analyses (as well as sector-time and region-time FE; see Table 4.10). In the first stage, we observe certain relations that are in line with the theory; those recruited to higher-level positions (lower rank) experience higher increases in wages, on average; large firms and firms with larger turnovers tend to pay their externally hired workers more compared to other firms.

On the contrary, companies with a higher internal pool on average pay less when recruiting externally (see also the results for the pool OLS regression in Table 4.16 in the Appendix). In the second stage, we then regress the firm FE from the first stage on a dummy indicating that a firm is a BLWR firm (or, alternatively, a variable capturing the percentage of workers on board) and a set of controls. We report the results of these estimates in Tables 4.10-4.11. In Table 4.11, we measure BLWR with a dummy for the presence of worker representation in the firm during the period of analysis (i.e., at least half of the period for which a firm is present in our sample) and, alternatively, by the average share of worker directors on board (during the period). Recall that the individuals considered in these estimations are thus only those the firms have recruited externally. On average, the BLWR firms associate with a higher increase in the basic hourly wage (model 1, Table 4.11). However, the difference between the BLWR and non-BLWR firms becomes statistically insignificant once we include additional firm-level time-invariant controls (i.e., earnings-tenure slopes; and period-averages for other control variables). Regardless of how we measure BLWR, the coefficient in the full model is positive but statistically insignificant, thereby providing no support to the conclusion that BLWR firms pay more for externally recruited management talent compared to non-BLWR firms. Panel A reports the estimates for the changes in the basic wage, while panel B shows the estimates for the change in the total hourly wage. Both set of results supports the conclusion that, on average, the managerial workers recruited by BLWR firms are on average paid no higher than those recruited to non-BLWR firms.

– Insert Table 4.10-4.13 here –

In Tables 4.12 and 4.13, we replicate the same analysis, while using the individual ability estimate (see above) as the dependent variable (for OLS estimates with individual ability as the dependent variable, see Table 4.17 in the Appendix). The models are estimated only for the external hires. The results for the first stage regression are reported in Table 4.13, while we show the second-stage results in Table 4.13. As indicated in Table 4.12, the firms with BLWR on average do not hire external individuals of that are less qualified (of lower ability) compared to the ones hired in non-BLWR firms. We find some other interesting (and anticipated relations). The ability of externally hired individuals is higher for those employed at higher ranks (lower values of our Rank variable) compared to those at lower level positions (within the broader management category). Larger firms and firms with higher value added (more productive firms) overall recruit individuals with higher ability; the same holds for older and probably more known and established corporations (see also Table 4.17 in Appendix).

Overall, these results reduce concerns about BLWR firms facing limitations in hiring on the external market. They, thus, provide support to the hypothesis that, ceteris paribus, BLWR firms prefer to recruit managerial workers by promoting internally rather than recruiting on the external labour market.

4.4.4 Robustness

The results of the empirical analysis presented above are in line with the hypothesized negative relationship between the strength of participatory practices in a firm, and this firm's propensity to hire externally rather than internally. The richness of our data allows us to control for a variety of firm and individual-level char-

acteristics to address the issue of the endogeneity of the participatory practices. We provide substantial supplementary analysis that supports the hypothesized relations and the channels underlying these relations. Regardless, the observed relations are only indicative of a causal relationship between BLWR and firms' propensity to source management talent in the external labour market.

Secondly, the categorization of positions in our data only allows us to capture boarder employment levels, meaning that the internal lateral transfers are not observed. This is different from the case of externally appointed candidates, where all moves, including horizontal moves, are observed in the data. This potentially constitutes a limitation to our study, as previous literature suggests that it might be important to distinguish between horizontal hires (lateral transfers) and hierarchical promotions (DeVaro et al., 2019). Theoretically, this means that we hypothesize that recruitment to managerial positions is a two-step process. In the first step, the firms source horizontally to fill a newly opened position. This first stage is not observed in our data. In the second stage (if the internal same-level candidate is not found), the firm fills the position by searching in the external labour market or promoting internally. This second step is the focus of this paper.

Moreover, external hires are (in our view) more comparable to internal promotions than to the internal horizontal moves. Indeed, even an external hire of a managerial level worker from a smaller firm could be considered a promotion, from both the individual's and the firm's perspective. Finally, the omission of the first step would be empirically an issue only if one should expect that the BLWR firms, on average, differ in their propensity towards lateral movements, compared to non-BLWR firms, and if the amount of the positions filled through lateral moves also

affected a firms' propensity to hire externally. Theoretically, it is hard to see why this could be the case. Further empirical analysis does not support such concerns. For example, the size of the top-level management teams is not significantly different in BLWR firms compared with non-BLWR firms.

4.5 Conclusion

The paper aims to advance the current understanding of the factors that shape firms' preferences about recruiting management talent through internal promotions rather than external hiring, by comparing the recruitment strategies in the companies, whose board of directors includes worker representatives (BLWR) and those with lower participatory practices. We combine the literature on internal labour markets and board-level worker representation to hypothesize and empirically confirm that participatory practices (BLWR) increase firms' inclination to recruit internally rather than externally. Theoretically, we attributed this result to the fact that workers' involvement in the firms' decision-making: 1) strengthens firm-specific human capital advantages of internal candidates, 2) improves the information flow about internal candidates to those in charge of the recruitment; and 3) increases the firms' propensity to hazard external candidates in promotion tournaments, due to inequality concerns. Our paper contributes to the recent stream of literature investigating the impact of organizational characteristics on firms' hiring strategies, focusing specifically on the recruitment of managerial talent. We also contribute to the literature on corporate governance and the literature on talent recruitment and internal labour markets, by investigating the relationship between

BLWR, internal labour markets, and firms' recruitment of management talent.

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4.6 Tables and Figures

Table 4.1: Descriptive statistics

	N	*Mean*	*Std. dev.*
Number of workers	1688	368.338	1155.571
Firm-years in sample	1688	14.360	4.061
Number of new managerial hires	1688	50.496	136.112
Number of new managerial hires$_1$	1688	49.435	133.753
Firm-years with new new managerial hires	1688	9.207	3.742
Firm-years with new new managerial hires$_1$	1688	9.132	3.735

Figure 4.1: Kernel diagram for the share of externally hired top executives

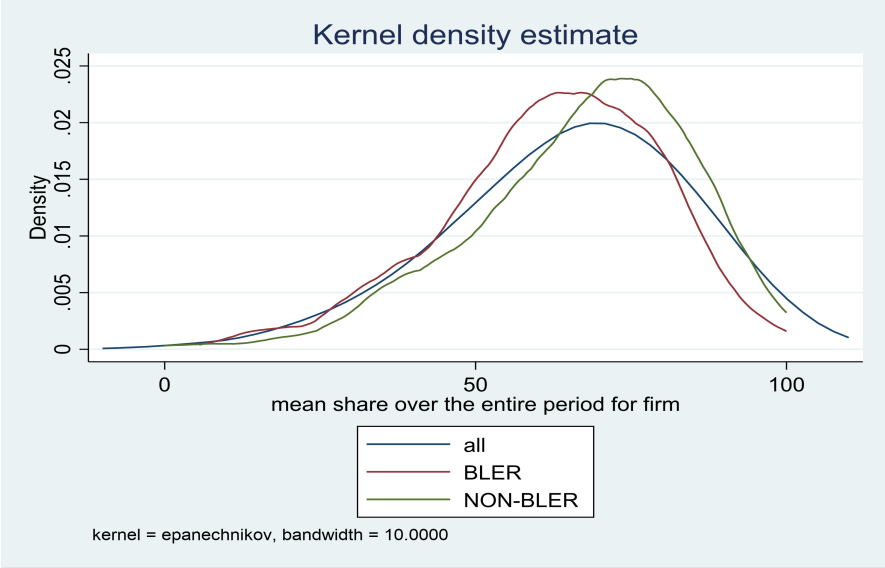

Table 4.2: Descriptive statistics for the share of externally hired

Panel A (all)	*N*	*Mean*	*Std. dev.*
Int prom (%)	1688	34.781	17.757
Exter (%)	1688	65.219	17.757
Exter1 (%)	1688	63.404	18.099
Int5 prom (%)	1662	39.308	26.207
Exter 5 (%)	1662	60.692	26.207
Exter 51 (%)	1662	58.374	26.534

Panel B (BLWR)	*N*	*Mean*	*Std. dev.*
Int prom (%)	717	37.640	17.406
Exter (%)	717	62.360	17.406
Exter1 (%)	717	60.452	17.533
Int5 prom (%)	709	40.112	25.629
Exter 5 (%)	709	59.888	25.629
Exter1 5 (%)	709	57.358	25.723

Panel C (non-BLWR)	*N*	*Mean*	*Std. dev.*
Int prom (%)	971	32.670	17.728
Exter (%)	971	67.330	17.728
Exter1 (%)	971	65.584	18.210
Int5 prom (%)	953	38.711	26.627
Exter 5 (%)	953	61.289	26.627
Exter1 5 (%)	953	59.130	27.111

Table 4.3: External hires (as % of externally hired managerial workers (external hires as those external to the firms and related firms within the group)

	(1)	(2)	(3)	(4)
BLWR		-2.383	-2.546	-3.420
		(0.974)**	(1.007)**	(1.008)***
Ln (firm age)$_{t-1}$	0.074	0.326	0.313	0.103
	(0.470)	(0.476)	(0.486)	(0.508)
Ln(workers)$_{t-1}$	-3.719	-3.368	-5.583	-5.849
	(0.458)***	(0.495)***	(0.585)***	(0.532)***
(VAworker (mio))$_{t-1}$	0.230	0.347	0.697	0.706
	(0.722)	(0.725)	(0.778)	(0.746)
Family firm	2.954	2.374	1.822	1.402
	(0.997)***	(1.009)**	(1.025)*	(1.046)
N firms in group	-0.454	-0.449	-0.471	-0.452
	(0.099)***	(0.098)***	(0.099)***	(0.099)***
NewA(% workers)			-2.921	-3.417
			(0.444)***	(0.291)***
Expert (% workers)$_{t-1}$			0.028	0.031
			(0.032)	(0.032)
Exits (% workers)			0.105	
			(0.059)*	
Turnover (% workers)			0.060	
			(0.016)***	
Slope (basic)				-131.425
				(38.288)***
Slope (squared)				-5.588
				(5.743)
R^2	0.13	0.13	0.16	0.17
N	13326	13326	13326	12764

Notes: Constant not reported. Sector-year and region-year fixed effects included. Standard errors clustered at firm level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4.4: External hires (as % of externally hired managerial workers (external hires as those external to the firms and related firms within the group)

	(1)	(2)	(3)	(4)
BLWR percent		-0.065	-0.071	-0.095
		(0.024)***	(0.025)***	(0.025)***
Ln (firm age)$_{t-1}$	0.074	0.361	0.353	0.131
	(0.470)	(0.475)	(0.485)	(0.508)
Ln(workers)$_{t-1}$	-3.719	-3.372	-5.578	-5.846
	(0.458)***	(0.488)***	(0.577)***	(0.525)***
(VAworker (mio))$_{t-1}$	0.230	0.327	0.681	0.684
	(0.722)	(0.725)	(0.779)	(0.747)
Family firm	2.954	2.310	1.736	1.279
	(0.997)***	(1.009)**	(1.025)*	(1.045)
N firms in group	-0.454	-0.448	-0.470	-0.451
	(0.099)***	(0.098)***	(0.099)***	(0.098)***
NewA (% workers)			-2.922	-3.422
			(0.445)***	(0.291)***
Expert (% workers)$_{t-1}$			0.027	0.031
			(0.032)	(0.032)
Exits (% workers)			0.105	
			(0.059)*	
Turnover (% workers)			0.060	
			(0.015)***	
Slope (basic)				-133.055
				(38.024)***
Slope (squared)				-5.552
				(5.677)
R^2	0.13	0.13	0.16	0.17
N	13326	13324	13324	12764

Notes: Constant not reported. Sector-year and region-year fixed effects included. Standard errors clustered at firm level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4.5: First stage regression

1st stage FE regression	*EXAPP*	*EXAPP$_1$*
Ln(individual wage rank)	-0.049	-0.043
	(0.002)***	(0.002)***
Ln(workers)$_{t-1}$	-0.083	-0.071
	(0.011)***	(0.011)***
(VAworker (mio))$_{t-1}$	0.002	0.007
	(0.008)	(0.008)
Exits (% workers)	0.001	0.000
	(0.000)*	(0.000)
Turnover (% workers)	0.001	0.001
	(0.000)***	(0.000)***
Ln(Assets)$_{t-1}$	0.036	0.017
	(0.008)***	(0.009)**
Ln(Sales)$_{t-1}$	-0.000	-0.000
	(0.003)	(0.003)
N firms in group	-0.001	-0.002
	(0.000)**	(0.000)***
Expert (% workers)$_{t-1}$	-0.001	-0.001
	(0.000)*	(0.000)*
Family firm	-0.064	-0.059
	(0.013)***	(0.013)***
NewA (% workers)	-0.023	-0.022
	(0.001)***	(0.001)***
R^2	0.30	0.29
N	52,951	52,951

Notes: Constant not reported. Sector-year and region-year fixed effects included. Standard errors clustered at firm level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4.6: Second stage, Fixed effect regression

	First stage Firm FE residual (group corrected)		
$BLWR_{(\text{at least half period})}$	-0.026	-0.029	-0.033
	(0.012)**	(0.014)**	(0.014)**
$(VAworker\ (mio)_{t-1})_{average}$		0.016	0.025
		(0.013)	(0.014)*
$Ln(firm\ age_{t-1})_{average}$		-0.000	-0.002
		(0.007)	(0.007)
$Ln(N\ workers_{t-1})_{average}$		0.030	0.031
		(0.006)***	(0.006)***
$Family\ firm_{(\text{at least half period})}$		0.111	0.105
		(0.018)***	(0.018)***
Slope 1 (basic)			-1.110
			(0.540)**
Slope 1 (squared)			-0.002
			(0.085)
R^2	0.20	0.23	0.25
N	1581	1580	1444

Notes: Constant not reported. Sector and region fixed effects included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4.7: Second stage, Fixed effect regression

	First stage Firm FE residual (group corrected)		
$BLWR_{(\text{average for dummy})}$	-0.024	-0.028	-0.033
	(0.013)*	(0.014)*	(0.015)**
$(VAworker\ (mio)_{t-1})_{average}$		0.015	0.025
		(0.013)	(0.014)*
$Ln(firm\ age_{t-1})_{average}$		-0.000	-0.003
		(0.007)	(0.007)
$Ln(N\ workers_{t-1})_{average}$		0.030	0.031
		(0.006)***	(0.006)***
$Family\ firm_{(\text{at least half period})}$		0.112	0.105
		(0.018)***	(0.018)***
Slope (basic)			-1.118
			(0.542)**
Slope (squared)			-0.003
			(0.085)
R^2	0.20	0.23	0.25
N	1581	1580	1444

Notes: Constant not reported. Sector and region fixed effects included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4.8: Second stage, Fixed effect regression

	First stage Firm FE residual (group corrected)		
BLWR $\text{percent}_{\text{average}}$	-0.001	-0.001	-0.001
	(0.000)*	(0.000)*	(0.000)*
$(\text{VAworker (mio)}_{\text{t-1}})_{\text{average}}$		0.015	0.024
		(0.013)	(0.014)*
$\text{Ln(firm age}_{\text{t-1}})_{\text{average}}$		-0.001	-0.003
		(0.007)	(0.007)
$\text{Ln(N workers}_{\text{t-1}})_{\text{average}}$		0.030	0.030
		(0.006)***	(0.006)***
$\text{Family firm}_{\text{(at least half period)}}$		0.112	0.107
		(0.018)***	(0.019)***
Slope 1 (basic)			-1.095
			(0.542)**
Slope 1 (squared)			0.000
			(0.084)
R^2	0.20	0.23	0.25
N	1581	1580	1444

Notes: Constant not reported. Sector and region fixed effects included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4.9: Summary statistics: Ability of newly hired individuals

All newly hired				
		N	*Mean*	*Std. dev.*
Non-BLWR	ability	32190	0.064	.323
BLWR	ability	46107	0.073	.318
Externally recruited				
Non-BLWR	ability	17707	0.075	.323
Non-BLWR	from same position	16620	37.85%	
BLWR	ability	20713	0.112	.322
BLWR	from same position	20108	54.79%	
Internally recruited				
Non-BLWR	ability	14483	0.052	0.323
BLWR	ability	25394	0.040	0.311

Notes: Division into BLWR and non-BLWR firms conditional to the firm having at worker directors for at least half of the period during which the firm is observed in the sample.

Table 4.10: BLWR and wage increases for externally recruited (first stage)

Externally hired		
	Delta wage (basic)	*Delta wage (total)*
Ln(rank position)	-7.569	-5.074
	(0.370)***	(0.378)***
Individual ability (estimate)	-5.909	-2.919
	(1.041)***	(1.063)***
$Ln(workers)_{t-1}$	6.378	5.222
	(1.423)***	(1.454)***
$(VAemploye\_mio)_{t-1}$	0.380	-0.798
	(1.107)	(1.130)
Exits (% workers)	0.050	0.069
	(0.028)*	(0.029)**
Turnover (% workers)	0.025	0.031
	(0.006)***	(0.007)***
$Ln(Assets)_{t-1}$	0.035	-0.763
	(1.181)	(1.206)
$Ln(Sales)_{t-1}$	-0.406	-0.475
	(0.407)	(0.415)
N firms in group	0.015	0.026
	(0.056)	(0.057)
Expert (% $workers)_{t-1}$	-0.124	-0.123
	(0.054)**	(0.056)**
Family firm	-4.349	-3.953
	(1.649)***	(1.683)**
NewA (% workers)	0.330	0.124
	(0.108)***	(0.110)
R^2	0.26	0.23
N	13601	13571

Notes: Region-year and sector-year dummies included. Constant not reported. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4.11: BLWR and wage increases for externally recruited (second stage)

Panel A	*Firm FE residual (Delta basic wage (winsorized)*		
$BLWR_{(at\ least\ half\ of\ period)}$	1.383	1.932	
	(1.169)	(1.300)	
$BLWR_{(percent,\ average)}$			0.045
			(0.036)
Slope (basic)		-18.655	-19.192
		(45.199)	(45.176)
Slope (squared)		2.236	2.113
		(5.774)	(5.768)
$(VAworker\ (mio)_{t-1})_{average}$		6.500	6.546
		(1.686)***	(1.691)***
$Ln(firm\ age_{t-1})_{average}$		0.100	0.138
		(0.601)	(0.600)
$Ln(N\ workers_{t-1})_{average}$		-1.017	-0.983
		(0.622)	(0.626)
$Family\ firm_{(at\ least\ half\ of\ period)}$		1.745	1.709
		(1.539)	(1.555)
R^2	0.36	0.40	0.40
N	1432	1337	1337

Panel B	*Firm FE residual (Delta total wage (winsorized)*		
$BLWR_{(at\ least\ half\ of\ period)}$	2.397	1.965	
	(1.157)**	(1.285)	
$BLWR_{(percent,\ average)}$			0.048
			(0.036)
Slope (basic)		-41.446	-41.541
		(43.689)	(43.724)
Slope (squared)		-0.570	-0.666
		(5.311)	(5.330)
$(VAworker\ (mio)_{t-1})_{average}$		7.709	7.751
		(1.679)***	(1.682)***
$Ln(firm\ age_{t-1})_{average}$		0.120	0.149
		(0.590)	(0.590)
$Ln(N\ workers_{t-1})_{average}$		-0.093	-0.074
		(0.599)	(0.605)
$Family\ firm_{(at\ least\ half\ of\ period)}$		-0.493	-0.499
		(1.514)	(1.525)
R^2	0.32	0.36	0.36
N	1432	1337	1337

Notes: Sector and region dummies included. Constant not reported. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4.12: BLWR and estimated ability for externally recruited (first stage)

Stage 1	*Individual ability (estimate)*
Ln (rank position)	-0.155
	(0.002)***
Ln(workers)_{t-1}	0.073
	(0.010)***
$\text{VAworker (mio)}_{t-1}$	-0.006
	(0.008)
Exits (% workers)	-0.000
	(0.000)
Turnover (% workers)	0.000
	(0.000)
Ln(Assets)_{t-1}	0.025
	(0.008)***
Ln(Sales)_{t-1}	-0.002
	(0.003)
N firms in group	0.000
	(0.000)
$\text{Expert (\% workers)}_{t-1}$	0.000
	(0.000)
Family firm	-0.036
	(0.011)***
NewA (% workers)	0.004
	(0.001)***
R^2	0.35
N	23,057

Notes: Constant not reported. Region-time and sector-time dummies included. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4.13: BLWR and estimated ability for externally recruited (second stage)

Firm FE (individual ability), second stage			
$BLWR_{(\text{at least half of period})}$	0.014	0.004	
	(0.009)	(0.010)	
$BLWR_{(\text{percent, average})}$			0.000
			(0.000)
Slope (basic)		1.957	1.968
		(0.375)***	(0.375)***
Slope (squared)		0.169	0.169
		(0.045)***	(0.046)***
$(\text{VAworker (mio)}_{t-1})_{\text{average}}$		0.028	0.028
		(0.014)**	(0.014)*
$\text{Ln(firm age}_{t-1})_{\text{average}}$		0.011	0.011
		(0.005)**	(0.005)**
$\text{Ln(N workers}_{t-1})_{\text{average}}$		0.012	0.012
		(0.005)**	(0.005)**
$\text{Family firm}_{(\text{at least half period})}$		0.009	0.010
		(0.014)	(0.014)
R^2	0.26	0.28	0.28
N	1520	1404	1404

Notes: Sector and region dummies included. Constant not reported. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Appendix

Definitions of job positions and hires internal versus external

We define managerial positions using the Statistics Denmark occupational variable (STILL) that defines the position of workers' most important employment by November 1st. The STILL variable aggregates the international classification ISCO into top managers (STILL = 31), top-level workers (STILL = 32), middle-level workers (STILL = 34), basic-level workers (STILL = 35) and other workers (STILL = 36). In this paper we consider hires to top management positions only. If a worker is hired from a lower-level position to a top management position within the same firm, this move is considered an internal hire. If a worker is registered in a top management position for the first time in the current firm, and not registered with any occupation in a firm belonging to the current firm the previous year, we consider this an external hiring. We do not distinguish between external hires from top manager positions respectively lower-level positions in our baseline specification. To avoid spurious moves, we rely on the Firm-Integrated Database for Labor Market Research (FIDA) time-invariant establishment identifiers, that only change in cases of simultaneous changes in owners and addresses.

Further, we carry out corrections and cleaning procedures on data. We exclude cases of newly established firms, as there is no trade-off between internal and external hires in these firms. Occasionally we observe missing values for the first year in the Statistics Denmark occupational variable. In these cases, we impute the position for the first year in a new job with the position in the second year. If a

position is not registered for more than one year, we dismiss the worker from our data completely. Finally, if the position of a worker is missing for one or two years, and the registered positions are the same both before and after, we impute with this position category.

Table 4.14: Definition of variables

Variable	*Description*	*Source*
Worker level characteristics		
ExApp	ExApp is a binary variable that takes a value of 1 if the managerial position at firm is filed by an external hire, and 0 if the position has been filled by internal promotion	Administrative registers
Basic hourly wage	Hourly contracted wage for firm workers	Administrative registers
Total hourly wage	Hourly contracted wage plus pension benefits, bonuses, overtime payments, and other benefits for firm workers.	Administrative registers
Firm level characteristics		
Firm age	Number of years since the firm was founded.	Accounting and administrative registers
Total assets	Total assets.	Accounting and administrative registers
Value added per worker	Total value added of the firm divided by the total number of workers.	Accounting and administrative registers
Region	The region of the firm headquarters.	Administrative registers
Sector	A 16-level sector categorization	Administrative registers
Number of workers	A total number of workers in the firm by November 1^{st}.	Administrative registers
Slope	This is the firm-level coefficient of the earnings-age-slope (first and second order) regression estimated with log(wage) as the dependent variable. All workers with wage and education information are included in the estimation.	Administrative registers
Number of firms in group	This variable counts the total number of firms within the same business group. Firms are categorized as group members in cases of at least 50% ownership by another firm. If the firm is not part of a business group, the variable takes the value 0.	The Danish Business Authority and administrative registers
Turnover	Percentage of total number of firm workers who leave the firm either as a result of a fire or a voluntary quit	Administrative registers

Table 4.14: Definition of variables (continued)

Variable	*Description*	*Source*
Firm level characteristics		
Number of newly appointed	Number of workers appointed during the past year	Administrative registers
Exits	Percentage of total number of firm workers who leave the firm either as a result of a fire or a voluntary quit	Administrative registers
BLWR	A dummy indicating if there is at least on worker elected director in the board of directors.	The Danish Business Authority and administrative registers
BLWR percent	Percentage of worker directors as a percentage of total number of directors in the board.	The Danish Business Authority and administrative registers
Family firm	A dummy taking the value 1 if either a family relation exists between two or more directors or between on or more directors and firm executives.	The Danish Business Authority and administrative registers

Table 4.15: FE Second stage, weighted covariates Dependent variable: First stage Firm FE residual

Panel A			
$BLWR_{(\text{at least half of w-period})}$	-0.026	-0.028	-0.032
	(0.012)**	(0.014)**	(0.014)**
$(VAworker\ (mio)_{t-1})_{w\text{-average}}$		0.015	0.024
		(0.013)	(0.014)*
$Ln(firm\ age_{t-1})_{w\text{-average}}$		-0.002	-0.004
		(0.007)	(0.007)
$Ln(N\ workers_{t-1})_{w\text{-average}}$		0.029	0.030
		(0.006)***	(0.006)***
Family firm (at least half w-period)		0.112	0.105
		(0.018)***	(0.018)***
Slope 1 (basic)			-1.110
			(0.540)**
Slope 1 (squared)			-0.001
			(0.085)
R^2	0.20	0.23	0.25
N	1581	1580	1444
Panel B			
$BLWR_{w\text{-average}}$	-0.024	-0.026	-0.031
	(0.013)*	(0.014)*	(0.015)**
$(VAworker\ (mio)_{t-1})_{w\text{-average}}$		0.014	0.024
		(0.013)	(0.014)*
$Ln(firm\ age_{t-1})_{w\text{-average}}$		-0.002	-0.004
		(0.007)	(0.007)
$Ln(N\ workers_{t-1})_{w\text{-average}}$		0.029	0.030
		(0.006)***	(0.006)***
Family firm (at least half w-period)		0.112	0.106
		(0.018)***	(0.018)***
Slope 1 (basic)			-1.117
			(0.542)**
Slope 1 (squared)			-0.002
			(0.085)
R^2	0.20	0.23	0.25
N	1581	1580	1444
Panel C			
$BLWR_{percent,\ w\text{-average}}$	-0.001	-0.001	-0.001
	(0.000)*	(0.000)	(0.000)*
$(VAworker\ (mio)_{t-1})_{w\text{-average}}$		0.014	0.023
		(0.013)	(0.014)*
$Ln(firm\ age_{t-1})_{w\text{-average}}$		-0.002	-0.005
		(0.007)	(0.007)
$Ln(N\ workers_{t-1})_{w\text{-average}}$		0.029	0.029
		(0.006)***	(0.006)***
Family firm (at least half w-period)		0.113	0.107
		(0.018)***	(0.019)***
Slope 1 (basic)			-1.092
			(0.541)**
Slope 1 (squared)			0.001
			(0.084)
R^2	0.20	0.23	0.25
N	1581	1580	1444

Notes: Sector and region dummies included. Constant not reported. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4.16: Mechanisms, pooled OLS individual-level, externally hired individuals

Pooled OLS individual		*Delta wage (winsorized)*	
$BLWR_{(at\ least\ half\ of\ period)}$	1.675	-1.053	-1.039
	(1.016)*	(1.050)	(1.052)
Previously on same position	-9.449	-11.308	-11.123
	(0.557)***	(0.645)***	(0.643)***
Ln(rank position)	-2.432	-6.325	-6.603
	(0.290)***	(0.548)***	(0.618)***
Ln(education)	1.217	-1.779	-1.790
	(0.832)	(0.958)*	(0.984)*
Female	2.083	2.726	2.537
	(0.634)***	(0.726)***	(0.719)***
Slope 1 (basic)		-64.973	-56.340
		(36.427)*	(36.882)
Slope 1 (squared)		-0.318	0.134
		(3.289)	(3.368)
$Ln(N\ workers)_{t-1}$		3.738	3.862
		(0.722)***	(0.752)***
$VAworker\ (mio)_{t-1}$		0.187	0.103
		(0.981)	(0.979)
Exits (% workers)		0.072	0.073
		(0.051)	(0.051)
Turnover (% workers)		0.031	0.031
		(0.007)***	(0.007)***
$Ln(Assets)_{t-1}$		1.813	1.903
		(0.447)***	(0.451)***
$Ln(Sales)_{t-1}$		0.327	0.323
		(0.326)	(0.325)
N firms in group		-0.006	-0.010
		(0.048)	(0.049)
$Ln(age)_{t-1}$		-0.773	-0.722
		(0.488)	(0.492)
Expert (% $workers)_{t-1}$		0.060	0.062
		(0.031)*	(0.031)**
Family firm		-0.637	-0.700
		(1.204)	(1.198)
NewA (% workers)		0.267	0.288
		(0.194)	(0.206)
Individual ability (estimate)			-1.730
			(1.332)
R^2	0.09	0.12	0.12
N	14,853	12,438	12,298

Notes: Region-year and industry-year time dummies included. Constant not reported. Standard errors (in brackets) clustered at the firm level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4.17: Mechanisms, pooled OLS for externally hired individuals

	Individual ability (estimate)	
$BLWR_{(at\ least\ half\ of\ period)}$	0.063	0.001
	(0.011)***	(0.009)
Previously on same position	0.055	0.043
	(0.006)***	(0.005)***
Ln(rank position)	-0.047	-0.120
	(0.004)***	(0.004)***
Ln(education)	0.053	0.011
	(0.007)***	(0.007)
Female	-0.113	-0.083
	(0.009)***	(0.006)***
Slope 1 (basic)		2.287
		(0.376)***
Slope 1 (squared)		0.151
		(0.053)***
$Ln(N\ workers)_{t-1}$		0.066
		(0.006)***
$VAworker\ (mio)_{t-1}$		0.009
		(0.007)
Exits (% workers)		0.001
		(0.000)**
Turnover (% workers)		-0.000
		(0.000)
$Ln(Assets)_{t-1}$		0.034
		(0.004)***
$Ln(Sales)_{t-1}$		-0.000
		(0.003)
N firms in group		0.000
		(0.000)
$Ln(age)_{t-1}$		0.007
		(0.004)*
$Expert\ (\%\ workers)_{t-1}$		0.000
		(0.000)
Family firm		-0.033
		(0.009)***
NewA (% workers)		0.004
		(0.001)***
R^2	0.18	0.27
N	24,094	18,628

Notes: Region-year and industry-year time dummies included. Constant not reported. Standard errors (in brackets) clustered at the firm level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

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