Board-level Employee Representation and Firms' Responses to Crisis[‡]

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We hypothesize that companies with board level employee representation (BLER) should experience a lower probability of crisis-induced dismissals than other firms. Theoretically, we link this effect to the employee directors' ability to reduce the information asymmetry and moral hazard in employee-employer contracting, thereby facilitating the implementation of labor-cost adjustments that are an alternative to workforce dismissals. We confirm our hypotheses by analyzing the behavior of Scandinavian public corporations with/without employee directors during the Great Recession. We show that BLER associates with significantly lower performance-sensitivity of employment cuts during the crisis period. In these firms, the lower likelihood of employment reductions was in part ensured through alternative measures providing for a reduction of the labor costs per employee.

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> "…[t]he importance of the ability of employers and employees to tackle shifting economic conditions was amply demonstrated during the crisis when many employers worked with employees and their representatives, in particular at the company level, to help keep companies afloat, reducing the need for job losses and helping to retain key skills through, for instance, short-time working" (CEEMET, 2012, p. 3).

1 Introduction

The economic consequences of workers' participation in corporate decision-making, in particular through their representatives on the board of directors (board-level codetermination), have been given some consideration in the academic literature (e.g. Addison and Schnabel, 2011; Fauver and Fuerst, 2006; Gorton and Schmid, 2004; Jones, 1987; Svejnar, 1981). More recently, the public and academic debate about this characteristic of the employer-employee relationship has been gaining new momentum, with anecdotal evidence pointing to the relevance of employer-employee cooperation for swift adjustment to unfavorable economic conditions during the Great Recession (CEEMET 2012; Glassner et al., 2011; Svalund et al., 2013).[1] This paper aims to contribute to that debate by analyzing the association between board-level employee representation (BLER) and firms' behavior in the event of a negative demand shock. Specifically, we discuss theoretically and analyze empirically how employee directors facilitated *cooperative* adjustments at the company level during the Great Recession.[2]

Across Europe, companies responded to the last crisis by undertaking actions to reduce labor costs, from dismissals and early retirements to more integrative solutions based on employee-employer agreements on internal redeployments, temporary working adjustments and changes in pay systems (Glassner et al., 2011; Svalund et al., 2013). Theoretically, when workers care about both wages and employment, as is likely the case during an industry-wide or global crisis, integrative solutions, which allow workers to trade a (temporary) reduction in their earnings for employment, are Pareto superior to unilateral employment cuts (Aoki, 1984; McDonald and Solow, 1981). Bargaining over integrative agreements is, however, subject to information asymmetries and moral hazard problems (e.g. Aidt and Tzannatos,

[1] Accordingly, we observe a renewed interest in employee board participation (codetermination) in some European countries. For example, the British Prime Minister Theresa May contemplated providing British employers with such an option.

[2] With the term "*cooperative*" we refer to integrative solutions that should be preferable for both management and employees, such as solutions that involve alternative measures of labor-cost savings in the interest of preserving employment during a crisis (McDonald and Solow, 1981; Aoki, 1984; Glassner et al., 2011; Svalund et al., 2013). Note that we use the terms *cooperative* and *integrative* interchangeably in this paper.

2002). Therefore, the negotiation and implementation of integrative agreements might be conditional on the existence of mechanisms that facilitate the exchange of information between the parties, provide credibility for the information exchanged and ensure an ex-post commitment to the negotiated outcome (Freeman and Lazear, 1995). Employee representatives on the board might constitute such a mechanism (Aoki, 1984; Freeman and Lazear, 1995; Kochan and Osterman, 1994). Given that they are elected by the employees and, as board members, also accountable to the firm, these directors should be able to credibly transfer information on the preferences of both employees and employers (shareholders and management), thereby facilitating the efficient information exchange necessary for integrative solutions (e.g. Aoki, 1984; Freeman and Lazear, 1995). Moreover, when employees participate in the design of the firm's policy, through their representatives on the board, they will less likely renege on the reached agreements ex-post by, for example, adjusting their effort downward (e.g., McCain, 1980; Mizrahi, 2002).

Based on this, we propose that companies with employee representatives on their boards (BLER) should be better able than other firms to negotiate alternative ways of reducing labor costs, such as temporary layoffs, work sharing and other integrative measures, and consequently less likely to cut employment in the case of poor performance. We test this hypothesis using a sample of 365 publicly listed non-financial firms from Denmark, Sweden and Norway (Scandinavian countries) during the 2008-2009 crisis (Great Recession).[3] The Scandinavian setting is well suited to this study for a number of reasons. *First*, workers in Scandinavian firms have the possibility but not an obligation to establish BLER. That is, employee directors are present on the boards of firms whose employees, at some point in the past, have exercised their codetermination rights and demanded the introduction of BLER. Consequently, employee directors are found in about half of the non-financial publicly listed firms in our sample; this allows us to draw inferences on the differences between the behavior of these firms and comparable publicly listed firms without employee directors. Moreover, the BLER rights have been in place since the seventies; accordingly, the BLER statuses of our sample firms have not changed since before the period of our analysis, which mitigates reverse-causality concerns in our study. *Second*, unlike in Germany, where employee directors can hold up to half of the board seats, workers' representation in Scandinavian firms is, by law, limited to a non-majority share. Because of this, employee directors should be more inclined to enter into negotiations with the firms' management than to resist any cost cuts. *Third*, as did many other European firms (e.g. Gross and Acidi, 2010; European Commission, 2009), Scandinavian companies faced a substantial drop in consumer demand during the Great Recession. In Sweden and Denmark, for instance, the demand for manufacturing fell by 20 percent during 2008-2009, on average, demanding substantial and

[3] The US National Bureau of Economic Research (NBER) places the Great Recession between December 2007 and June 2009. See http://www.nber.org/cycles.html (accessed November 25th, 2017). For European firms, we allocate the years 2008 and 2009 to this time period (see for instance Glassner et al., 2011).

swift reductions in labor costs (Svalund et al., 2013). Scandinavian companies responded with a variety of measures, from workforce cuts to novel integrative solutions (Svalund et al., 2013). Although, theoretically, the negotiation of the latter is less feasible in systems with collective bargaining (Aidt and Tzannatos, 2002) as is the case in Scandinavia, the local actors reportedly operated with substantial leeway to arrive at the most efficient solutions (Svalund et al., 2013). Allegedly, while national institutions and collective agreements shaped the repertoire of possible measures of burden sharing at the company level, company-level negotiations represented the key arena for bargaining over the crisis adjustments, thereby requiring extensive cooperation between firms' management and employees (Glassner et al., 2011; Svalund et al., 2013).

Previewing the results of our empirical analysis, we find that firms with BLER were significantly less likely to enact performance-induced employment cuts during the crisis period. More precisely, we document that, during the crisis, the layoff decisions in BLER firms were significantly less related to firm performance than was the case in firms without BLER. Indeed, our data suggest that during the crisis the employment cuts in BLER firms exhibited no relationship to firm performance. We also show that the lower likelihood of performance-induced dismissals in BLER firms was in part ensured by the implementation of alternative cost-saving measures, resulting in a decrease in labor costs per employee. These results support our theoretical propositions on the superiority of BLER firms in the implementation of cooperative solutions during a crisis.

Although these results are based on firm-fixed effects or first-difference estimators, and are in line with the theoretical arguments and anecdotal evidence offered in the literature, our research design does not allow for perfect identification, as BLER status is, by the definition of the law, an endogenous choice of the employees. We mitigate this issue in a number of ways. *First*, we provide substantial theoretical, institutional and secondary case evidence in support of the fact that company-level cooperation between the management and employees was crucial to the achievement of integrative company-level solutions during the Great Recession, and that such solutions were made possible and even facilitated by the Scandinavian collective bargaining systems (Svalund et al., 2013; Andersen et al., 2014). The extant case-based evidence also indicates that the implementation of such solutions was somewhat easier in the firms with long traditions of company-level negotiations and with workers' representation within the top organizational layers (Svalund et al., 2013; Glassner et al., 2011). *Second*, more technically, we inspect the differences in the observable characteristics of firms with and without employee directors and, subsequently, include a number of firm-specific covariates in all our regressions. The right to install employee board representation in Scandinavia applies to small, medium-sized and large firms. We find that the BLER status in these firms is positively associated with firms' age and size, but also with headquarter location, sector affiliation and the firms' business models. *Third*, we measure employee board representation as of the year 2007; since the crisis was unexpected, using a pre-crisis year to measure BLER should reduce

reverse-causality issues.[4] *Fourth*, we separate the effect of employee board representation (BLER) from a battery of other characteristics that could potentially drive our results (firm size, regional characteristics, family control and union density) by including additional interaction terms in our main regressions. *Finally*, we corroborate our results by implementing a number of robustness checks, such as using alternative definitions of the dependent variable, firm performance, different country-subsamples and different time periods.

Our study makes two key contributions to the literature. *First*, we complement the extant empirical literature on the economic consequences of BLER, which has thus far mostly built on the German case of parity board codetermination. Using the Scandinavian case, we show that the joint involvement of employees and shareholders in formulating strategic responses is possible even in non-parity codetermination systems, and that it can lead to mutually beneficial outcomes during crises. With this, we provide new evidence in support of employee board representation, thereby advancing the stream of research that regards codetermination as an efficient way to manage labor relations, reduce shareholder-labor conflict and facilitate efficient adjustments to economic shocks (Strauss and Rosenstein, 1970; Aoki, 1984; Freeman and Lazear, 1995). *Second*, by corroborating previous notions of how employee board participation shapes labor-cost-related policies during crises, our study contributes to the scholarly work shedding light on the role of governance characteristics in shaping firms' adaptation to the Great Recession and other environmental changes (e.g. Lins et al., 2013; Svalund et al., 2013; Frank, 2014). Our findings suggest that other governance characteristics, such as the presence of owners with significant share of voting rights, were not equally beneficial with regards to employment security during the Great Recession, thereby suggesting that cooperative solutions in the sense of Aoki (1984), gained through formal involvement of employees in firms' strategic decisions, cannot be entirely replicated by other governance mechanisms.

The remainder of the paper is organized as follows. Section 2 explains our theoretical framework. Section 3 describes the institutional setting. In Section 4, we present the data and variables, and outline the results of the empirical analysis. Section 5 concludes.

2 Theoretical framework

For most firms, labor is a fundamental ingredient of the production process and simultaneously an important cost driver.[5] Accordingly, a negative shock in the product market will undoubtedly require some adjustment in terms of labor costs. While a static view might suggest that the best strategy is to simply cut

[4] For a similar approach, see for example Lins et al. (2013).

[5] Although we do not fully spell out the theoretical model, our arguments and intuition borrow from the labor economics literature (for an overview, see for example Lawson, 2011). Also, note that we ignore taxes in our arguments. However, one might easily incorporate tax arguments without materially altering the conclusions.

employment, a more dynamic perspective acknowledging that labor costs are characterized along two dimensions, i.e. level of employment and wages, suggests a more balanced view, in which the employment and wages are adjusted simultaneously. To see this, consider the static model of a firm with a fixed production technology that translates labor L into profit π as follows:

$$\pi(L) = R(L) - wL \tag{1}$$

where $R(\cdot)$ is a concave function of operating profit before labor costs and wL denotes the direct labor costs that are, by assumption, a function of employment L and the wages w paid to the employees. For simplicity, we assume that employees are homogeneous and we ignore taxes here. The firm management is assumed to be interested in the optimal, i.e. profit-maximizing, size of the firm's operations, resulting in the optimal level of employment, L^*. Examining the first-order condition for Eq. (1), we see that the optimal firm size is a function of the market demand for goods or services produced by the firm, as represented by $R'(\cdot)$, and the level of wages the firm pays to its employees, w. Assuming that managers take the wages as given, Panel A of Figure 1 illustrates the resulting labor demand function of the firm, which is decreasing in the wage level w.

Figure 1 about here

Now assume the firm faces a negative shock in the product market. Technically, the function $R(\cdot)$ shifts to the Southwest. Thus, the optimizing manager will have to adjust the firm size and thus the labor costs. A manager who takes the wages as fixed will react by reducing employment L to a lower level, as shown in Panel B of Figure 1. Such a solution may, however, be less beneficial for the firm under a dynamic view, as it may result in higher hiring costs in the future, once the product market demand recovers (e.g. Glassner et al., 2011). Simultaneously, such a solution is suboptimal from the perspective of the employees. Arguably, workers care about both employment and the wage level, particularly in the case of high employment uncertainty during a crisis. Consequently, their utility function aggregates (i) the *inside option*, i.e. being employed by the firm, and (ii) the *outside option*, i.e. either being employed by another firm or receiving social transfers and enjoying leisure benefits in the case of unemployment, where aggregation reflects the level of employment within the firm or, put differently, the probability of being employed by the firm. Accordingly, employees of the firm with pre-shock employment policy (L^{pre}, w^{pre}) might evaluate the firm's response to the exogenous shock according to utility function

$$U(L, w) = \frac{L^{post}}{L^{pre}} \times u(w^{post}) + \frac{L^{post} - L^{pre}}{L^{pre}} \times u\left(w^{outside}\right) \tag{2}$$

where L^{post} (L^{pre}) is the post-shock (pre-shock) level of employment, w^{post} (w^{pre}) is the post-shock (pre-shock) wage level and $w^{outside}$ is the (indifference) wage level of the outside option. Eq. (2) suggests that employees would prefer to "trade" wages for higher employment, particularly when the gap between the inside and outside options is large. The resulting optimization problem of the firm is illustrated in Panel C of Figure 1. The one-sided "reduce employment" solution is thus likely to be suboptimal, and a Pareto-superior solution, from the perspective of employees and employers alike, could therefore be reached if the parties could agree on a response strategy that involved a reduction in wages or the implementation of measures that reduced labor costs at the given level of employment (Aoki, 1984)[6], such as temporary layoffs, work-sharing agreements, restructuring of bonus systems etc. The difference between integrative solutions, which follow a dynamic view and ensure the maintenance of high-skilled labor, and distributive solutions, where the employers' focus is primarily on immediate cost reductions, has also been outlined in relation to the Great Recession, with scholars underscoring the superiority of procedural innovations that involve some form of workers' concessions in return for employment guarantees (Glassner et al., 2011).

The implementation of response strategies that are Pareto superior to unilateral employment cuts is, however, subject to asymmetric information and moral hazard problems within the employer-employee negotiations. Specifically, workers know that managers (employers) may be tempted to exaggerate financial difficulties in order to justify lower wages or other concessions they demand from employees (Freeman and Lazear, 1995). Managers, on the other hand, might fear that workers will reduce their efforts following a negotiated reduction in their wages or other benefits. A mutual distrust may therefore trap the managers and employees in a prisoner's dilemma situation. That is, even if wage adjustments and other types of workers' concessions represent an efficient solution, this solution will not be reached if there is a high degree of asymmetry of information and the employees lack credible information about the state of the firm (Aoki, 1984; Freeman and Lazear, 1995).

Building on the anecdotal evidence and previous theoretical work, we argue that the implementation of mutually beneficial agreements during crises should be easier in companies in which employees are represented on the board of directors, compared to in other firms. *First*, since employees will already have been taking part in strategic decision-making before the crisis, the managers in such firms should be more experienced in negotiating with the employees in search of mutually beneficial strategies. As noted above, such experience was relevant for the implementation of plant-level agreements during the crisis

[6] Aoki (1984) builds on the classical work of Leontieff (1946) and McDonald and Solow (1981) to explore the inefficiency of unilateral decision-making in the case of a negative demand shock.

(e.g. Glassner et al., 2011). *Second*, when both employee and shareholder representatives are present on the board, they have the possibility of building up trust in stable times. This should facilitate the exchange of preferences, interests and priorities in crisis times, when information becomes blurry and less tangible and trust becomes important, and thus ensure the information exchange necessary for cooperative bargaining to occur (Aoki, 1984). *Third*, by taking part in decisions regarding firms' crisis responses, employee directors should also be able to provide credibility to other employees regarding any information conveyed by the employer. Without such credibility, workers would be reluctant to moderate their demands, make concessions or cooperate with the management. *Fourth*, building on Mizrahi (2002) and democratic theory, we argue that, in the firms with employee representatives, the workers' sense of responsibility regarding the outcomes and their willingness to cooperate with the other party will be higher than in other firms. When employees take part in decisions, they are more likely to perceive them as fair and necessary (e.g., Aoki, 1984; Freeman and Lazear, 1995). The risk of workers' ex-post opportunism (e.g., a reduction of work effort due to lower wages in the sense of Akerlof and Yellen, 1990) should therefore be lower in firms with employee directors. This should, in turn, also increase the employers' willingness to be involved in negotiations in the first place. Building on this, we propose that companies with employee directors on their boards of directors should be better able to implement integrative crisis responses to a demand shock, compared to other firms, and consequently less likely to substantially reduce employment following poor performance during the crisis of the Great Recession.

3 Institutional framework

Employment, wages and working conditions in Scandinavian countries have conventionally been determined within the system of collective bargaining. It is presumably this system that has, during the years, played a decisive role in ensuring a stable wage and employment growth, as well as an alignment between wages and productivity, and rather small income inequalities in Scandinavia. Collective bargaining has also complemented the labor market legislation, generating provisions related to working hours, paid vacation, sabbaticals, a minimum wage, leave arrangements, pensions, education and training (Andersen et al., 2014). Despite some differences, the Scandinavian countries have shared a number of common characteristics of the system, such as equally strong bargaining parties on both sides, high public- and private-sector coverage, and multi-level agreements with the bargaining taking place at national, industry and company levels (Andersen et al., 2014). Over the years, the relevance of the different levels has changed to the benefit of industry- and company-level negotiations. This trend is presumably the result of the European integration, globalization, shifting markets and increasing competition and, consequently, increasing demand from employers for more flexible wage formation, which has characterized the wage bargaining in most of the European countries (Glassner et al., 2011). As a consequence, especially in Denmark and Sweden, the collective bargaining agreements are nowadays more like framework agreements that set

limits within which wages and working hours can be negotiated locally. This, on the one hand, provides local actors with substantial rights to information and consultation rights in various areas, while on the other hand giving employers more leeway to find the most efficient solutions in cooperation with the employees, within the more centrally defined objectives, procedures and criteria (Andersen et al. 2014).

The increased flexibility of collective bargaining systems in Scandinavia was also revealed during the Great Recession when, reportedly, it allowed for and provided a steer and procedural certainty for much faster company-level cost adjustment compared to more decentralized systems (Andersen et al., 2014; Glassner et al., 2011). While the countries varied in terms of available mechanisms for labor market adjustments, the local actors in Denmark, Norway and Sweden had the possibility not just to cut employment[7] but also to work out alternative solutions or mechanisms that would enable them to avoid substantial dismissals during the crisis (Svalund et al., 2013; Glassner et al., 2011)[8]. Rather than direct pay cuts or wage freezing, the companies could choose between a set of other measures, alternatives to dismissals, such as reorganizing bonus systems (i.e. Denmark), renegotiating existing flexible time agreements, negotiating new types of work-sharing agreements and temporary layoffs (e.g. Denmark and Norway), and reductions of working time (e.g. Sweden). In certain cases, innovative types of solutions were developed, such as reduced work weeks, rotational periods of work and extended vacations (Svalund et al., 2013; Glassner et al., 2011). Regardless of the form adopted, these adjustments required extensive cooperation between management and employees, as solutions had to be acceptable to both parties (Svalund et al., 2013). Reflecting this, case evidence from companies across Europe shows that crisis-induced restructuring has frequently led to contestation between management and workforce, with workers' resistance to concessions such as reduced hours, temporary elimination of and reductions in bonus payments etc. preventing the implementation of company-level agreements (Glassner et al., 2011).

In the present study we focus on employee directors on corporate boards (BLER) and their role as facilitators of integrative company-level cost adjustments during the Great Recession. In Scandinavia, the employees of firms of a certain size (minimum 35 full-time employees in Denmark, 30 in Norway and 25 in Sweden) are granted the option of installing employee representation on the board of directors. That is, in order to be represented on the board, the employees have to propose and jointly support the introduction of such representation. In Denmark, for example, the proposal to establish such a representation can be put

[7] According to a reference reported by Svalund et al. (2013), in the wake of economic or production-related difficulties Nordic employers are allowed to dismiss employees without incurring any other costs than the payment of salaries throughout the notice period.

[8] For example, Denmark and Norway eased the existing arrangements for temporary layoffs and work-sharing schemes. In Sweden, the main actors in the manufacturing sector signed a path-breaking agreement for negotiated work- and burden-sharing that allowed for a reduction of working time at the company level to 80 percent without compensation; the companies could also decide to lay off employees for a limited number of days with a corresponding lower pay. Reportedly, the manufacturing sector provided a reference for the other sectors, resulting in a number of workplace-level agreements that allowed unpaid, temporary layoffs in order to save jobs (Svalund et al., 2013).

forward by 10 percent of the employees or a trade union representing that percentage. This option is then implemented if supported by the majority of the employees in the firm. The rights to be represented on the board of directors have been in place since the late seventies. Consequently, many firms have had such a representation in place for decades. The representatives on the board are elected by the employees of the firm, normally for a four-year term, and must be employed by the same company or business group. When elected, employee directors generally hold about a third of board seats, and are never a majority on the board[9]. Employee directors hold the same rights and obligations as shareholder-elected members of the board and, consequently, play an important role in firms' strategic decisions (Hansen, 2003).

During the Great Recession, the intermediaries at the industry and company levels reportedly played a key role in facilitating the implementation of solutions that involved workers' concessions in exchange for some form of employment guarantee (Glassner et al., 2011). Based on our reading of the extant theoretical and empirical literature, we in this paper assign the employee directors a central role in the company-level negotiations. Thus, we expect the effect of BLER on the implementation of cooperative solutions to be additive to the impact of other related institutions, such as labor unions. As described by Svalund et al. (2013), the unions in Scandinavia played a key role in negotiating adjustments in the central and sector-level regulation, which in turn facilitated the negotiations at the firm level. In firms, the strategic decisions with regards to cost adjustments were often taken at higher organizational levels (Svalund et al., 2013), such as the board of directors. These observations are in line with the tradition of employee board participation in Scandinavia. Specifically, the right to workers' representation on the board of directors was instituted in the late seventies with the aim of providing a platform for employer-employee cooperation, with a view in turn at aiding the long-term competitiveness and success of Scandinavian firms (e.g. Jackson, 2005).

4 Empirical analysis

4.1 Data and sample characteristics

We study the population of non-financial publicly listed firms operating in Scandinavia (Denmark, Sweden and Norway) at the end of 2007. For the purpose of the analysis, we hand-collected information on

[9] There are relatively minor differences in the weight of employee representation across the three Scandinavian countries. If employees in Denmark decide to be represented on the board of directors, the employee representatives should hold at least half as many board seats as are held by shareholder representatives, but in any case not fewer than two. In Sweden, the employees can elect two (three) board representatives in companies with at least 25 (1000) workers. In Norwegian firms employing at least 30 (50) workers, the employees can elect one representative (one third of the board and no fewer than two). In firms with at least 200 employees, the directors are nominated through an assembly consisting of 12 members, of which one third are employee representatives who can in turn decide to elect one third of the board from among the employees.

these companies' boards of directors from annual reports and other sources for the period 2004-2010, and supplemented these data with financial data (Worldscope) and ownership data (Bureau van Dijk) spanning the period 2004-2010.[10] Our final sample covers 365 unique Scandinavian firms. Based on this information, we define a number of variables. Foremost, we define *BLER* as the dummy variable that classifies the firms according to whether or not, at the end of 2007, they had at least one employee-elected director on the board (BLER=1). To allow for more granular analysis, we also define *RelativeBLER*, which measures the share of all board seats held by employee-elected directors at the end of 2007. Figure 2 illustrates the distribution of the non-financial firms in our sample based on *RelativeBLER*.

Figure 2 about here

To measure firm decisions with regards to employment and wages, we define two key variables, namely the variable *Labor Costs per Employee*, which is the total salaries and benefit expense standardized by number of employees, and the variable *Layoff 5+ Percent*, which is a dummy variable indicating firm years in which the firm reduces its laborforce by at least 5 percent. The choice of the latter variable follows extant studies that have previously identified a link between board structure and employment policies in Scandinavia (e.g. Matsa and Miller, 2013). The 5 percent workforce reduction measure is also in line with the EU definition of collective redundancies. According to the EU, any dismissal of 30 or more employees from a large firm should be considered a collective redundancy. This number (30) represents about 5 percent of all employees for the median firm in our sample (639 employees). For robustness, we define two additional employment measures, namely the *Layoff 10+ Percent* variable indicating the firm years in which a firm reduces its laborforce by at least 10 percent. Relatedly, the *Layoff* variable (censored at zero) measures the negative employment growth. In support of our dependent variable, we find that the incidence of 5+ percent (or 10+ percent) workforce reductions increased significantly during the crisis years.[11] As illustrated in Figure 3, during the pre-crisis period (2004-2007), the share of companies in our sample that reduced their workforce by at least 5 percent ranged between 13 and 18 percent: during the crisis years, the share of such firms reached and exceeded 40 percent. We observe a similar pattern when studying *Layoff 10+ Percent* (see Figure 3).

[10] The main sources of directors' data were publicly available corporate websites and annual reports. When in doubt, we checked the information using other sources (internet) or by contacting the companies directly.
[11] In an additional exercise, we run all the analyses again with a fourth variable, *Layoff 0+ Percent*. The results remain unaffected.

Figure 3 about here

Our regression models include a number of explanatory variables proxying for firm size, governance, union density and other firm characteristics. We measure firm size by the value of total assets, in logarithms (*Size*). We chose to use firm assets rather than the total number of firm employees to avoid multicollinearity problems in the empirical analysis; the total assets are less strongly correlated with the *BLER* dummy than is the number of employees, while they indeed correlate highly with the number of employees. Our performance measure is return on assets (*ROA*), defined as the EBIT (Earnings before Interest and Taxes) standardized by total assets. We measure the tangibility of firm assets by the net value of property, plant and equipment (PPE) standardized by total assets (*Tangibility*), as a percentage, and research intensity by research and development expenses standardized by total assets (*RnD*). *Leverage* is defined as total debt to total assets, as a percentage. *Age* is the logarithm of the years since the firm's establishment. Finally, *Block* captures the fraction of ownership held by the firm's largest owner (as a percentage). All variables are described in detail in Table 1.

Table 1 about here

Table 2 reports descriptive statistics for our variables as of 2007, i.e. the last pre-crisis year. As shown in the table, employee directors are found in 53 percent of our sample firms and hold nearly 15 percent of all board seats. When present on the board, these directors on average hold around a third of board seats (27.77 percent, see average value under BLER=1), i.e. about two seats on average. The percentage of seats held by employee directors varies across countries, though, the highest being in Denmark (34 percent on average), followed by Norway (30 percent) and then Sweden (23 percent).[12] The firms with employee directors were, in the year 2007, in many aspects different from the firms without employee directors; they were larger, older, more indebted but also relatively more profitable than the firms without employee directors. The higher incidence of employee representation among the larger and older firms is partly due to the fact that, in many large firms, employee representation was established within the supportive political climate that existed during the late seventies, and has been maintained ever since (for more on the path-dependency of BLER, see for example Gregoric and Poulsen, 2017).

[12] These numbers reflect the individual countries' legal rules on the number of board seats that employee directors should hold once employees decide to be represented on the board of directors. See the institutional framework description in Section 3 and Figure 1.

Table 2 about here

To provide further insights into the distribution of employee directorships, we next estimate a probit regression using a dummy for the presence of at least one employee-elected member on the board of directors in the year 2007 as the dependent variable (*BLER*) and a set of firm-specific covariates in the same year. We report the results in Table 3, Models (I)-(V). Model (I) is our basic model; in Model (II) we add firm ownership structure, namely the fraction of shares held by the firm's largest owner (*Block*) and a dummy capturing family control or the presence of owners with a long-term commitment due to disproportionate control (*Family*). Scholars have previously noted that such owners might be more sympathetic to workers' interests and internalize them within the decision-making (e.g. Lins et al., 2013). Consequently, employees might find it less valuable to be represented on the boards of such firms. Models (I) and (II) also include sector and country dummies[13]. Both models suggest that employee board representation is positively related to firm size and age; employees are more likely to be represented on the boards of research-intensive firms (see the coefficient for *RnD* measuring firms' investments in research and development, standardized by total firm assets*)*. Companies with employee directors also have, compared to other firms, on average higher levels of ownership concentration (*Block*).

Table 3 about here

The employee board representation also significantly associates with a number of sector dummies (coefficients for sector dummies not reported). To investigate the sector characteristics in more detail, in Model (III) we replace the sector dummies with two sector-level variables, namely a variable measuring union density (*Unionization*) and a variable measuring the percentage of other firms in the industry that have BLER *(BLER Industry)*[14]. To ensure comparability across the three Scandinavian countries, we use union density information provided in Andersen et al. (2014). This information refers to the year 2008 and is based on a broader sector classification, thereby distinguishing between public-sector firms, manufacturing, construction, retail and wholesale trade, hotels and restaurants, transport and finance. In Model (III), we include a few additional factors that might correlate with the employees' decision to be represented on the board. Specifically, to account for regional characteristics, we include a dummy for firms whose headquarters are based in the capital city (*Capital Location*), and the percentage of other firms in the region

[13] The sector dummies are based on two-digit SIC codes with further aggregations of similar groups in cases of one or very few firm observations per group.
[14] The definition of sectors here is compatible with the one used in Models (I) and (II). See footnote 13.

that have employee directors on their boards *(BLER Region).* We expect that workers will feel a stronger need to be represented in firms outside the capital region, where alternative employment opportunities might be more limited. We also include a dummy for the presence of the CEO on the board of directors (*CEO*)[15]; as a corporate insider, the CEO can facilitate information exchange between workers and shareholders, thereby again potentially reducing employees' motivation to be represented on the board.

The results of Model (III) confirm that employee representation concentrates within specific sectors, as employee representatives are more likely to be observed in the firms operating in sectors with an overall higher incidence of employee representation (see the positive coefficient for *BLER Industry).* In line with our expectations, employee directors are less common in the firms headquartered in the capital city; apart from this, employee representation does not seem to be concentrated in specific regions. The relationship between union density and employee board representation is positive but not statistically significant. Our observations with regards to the presence of employee directors on the board remain valid when using an alternative definition of employee representation, i.e. the percentage of employee directors on the board (*Relative BLER (%)*) in Models (IV) and (V). In addition to what is reported in Table 3, we inspect the causes behind eventual changes in employee representation across the years. For this purpose, we collect information on BLER from the year 2000 onwards. Specifically, we primarily want to exclude the possibility that the implementation of employee board representation is driven by the workers' anticipation of employment cuts. As first evidence against this, we observe that more than 90 percent of the firms in our sample have had BLER since the year 2000. We next estimate a firm-fixed-effects regression using the dummy for employee representation or the percentage of employee directors on the board as the dependent variable, and different measures of firm performance and other firm characteristics as explanatory variables. We estimate this regression using the 2000-2007 period. We find that the few changes in BLER during 2000-2007 mostly associate with changes in firm size. No other firm characteristics, a variety of firm performance measures in particular, have any significant effect on either the installation or dissolution of BLER (results not tabulated).

4.2 BLER and workforce reductions during the Great Recession

Following the line of enquiry of our theoretical propositions, we next analyze whether the companies with employee directors on their boards were less likely to reduce employment following a period of poor performance during the Great Recession (i.e. 2008-2009 crisis). Consequently, we estimate the following equation:

[15] By law, in Scandinavia, the CEO is not a member of the board of directors except when the firms' shareholders decide this should be the case.

$$y = \beta_1 \times Crisis \times BLER_{2007} \times ROA + \beta_2 \times Crisis \times BLER_{2007} + \beta_3 \times BLER_{2007} \times ROA \quad (3)$$
$$+ \beta_4 \times ROA + \beta_5 \times BLER_{2007} + \sum \beta_j \times X_j + \text{ fixed effects} + \varepsilon$$

where y is our layoff measure, and β_1 measures the difference in the performance-sensitivity of layoffs between BLER and non-BLER firms. In our baseline regression, we measure the layoffs by the variable *Layoff 5+ Percent*, i.e. a dummy variable indicating cases where, between t and (t+1), we observe a decrease of at least 5 percent in the number of employees. However, for robustness, we run our regressions twice more using alternative layoff measures, i.e. *Layoff 10+ Percent* and *Layoff*. Our key explanatory variable is the dummy variable indicating those firms with at least one employee-elected member on their boards (*BLER)*; the *Crisis* dummy indicates the time period of the peak of the Great Recession in Europe (i.e. the years 2008 and 2009). Our main coefficient of interest is the coefficient β_1, which measures the difference in the sensitivity of employment reductions to demand shocks (firm performance) between the firms with and without BLER during the Great Recession.

The set of control variables (X_j) includes all observable characteristics that should, theoretically, be relevant with regards to firms' propensity to cut employment, such as firm size, firm performance, tangibility of firm assets, research intensity, firm age and ownership structure. Besides the fact that firm size is positively correlated with BLER, we might expect large firms to be less likely to dismiss employees due to having more alternatives at their disposal (i.e. reallocation within the organization). A 5 percent dismissal would also imply a much greater number of layoffs in these firms, thereby more likely leading to public attention. Better-performing firms should have a lower propensity to reduce employment. In line with this expectation, we observe that, during the crisis period, the percentage of firms reducing employment by at least 5 percent was about 20 percentage points higher among firms that experienced a fall in operating performance, compared to other firms. We control for the assets' tangibility and research and development costs as human capital should be more relevant in firms with a higher share of intangible assets or that engage in research and development; in both cases we should therefore observe a lower propensity to cut employment. We control for leverage as more indebted firms face more constraints and might consequently be forced to reduce employment. To the contrary, firms with more concentrated ownership might be less exposed to capital market pressure and, therefore, also less restrained in their employment decisions. Firm age is included among the covariates because of the high incidence of employee representation among the older firms[16].

[16] For a full description of the variables and their sources, see Table 1.

We report the main results of the regression analyses in Table 4. The estimates reported in the table are based on 2004-2009, with the crisis years defined as 2008 and 2009. Our dependent variables for employment cuts are based on employment changes between t and (t+1); with the crisis effects we therefore capture employment changes during 2009 and 2010. As shown by Glasser et al. (2011), employment effects generally lag those in output during a recession and, although in the majority of the European countries output started to rise in 2010, the employment situation in most countries deteriorated in both 2009 and 2010. Adopting a forward-looking measure of layoffs also reduces concerns with regards to using ROA as a measure of performance at time t. In Models (I) and (II) in Table 4, Panel A, we show the estimates of a basic linear probability model for the firms without employee board representation (*BLER=0*) and the firms with employee board representation (*BLER=1*). According to the coefficients tabulated in Table 4, a lower operating performance (ROA) in normal times associates with a higher likelihood of workforce reduction in both types of firms. During the crisis, however, the picture changes (see the coefficient for *ROA x Crisis*); while performance-sensitivity remains unaffected in firms without BLER (BLER=0), it falls significantly in BLER firms.

To test for the statistical significance of the observed differences, we pool both subsamples and, in Models (III) and (IV), include a triple interaction term (*BLER x ROA x Crisis*) and the corresponding double interaction terms. Model (III) includes time-, sector- and country-fixed effects, while Model (IV) includes time- and firm-fixed effects. Confirming what was observed in Models (I) and (II), the triple-interaction term is positive and significant in both specifications. This suggests that, during the Great Recession, the performance-sensitivity of employment was significantly lower in BLER firms but not in other firms. Based on the size of the coefficients, we can conclude that, during the crisis, firm performance had no effect on laborforce reductions in BLER firms (F = 0.62; Prob > 0.43).

To validate our results, in Panel B we re-estimate Models (III) and (IV) using the alternative definitions of employment cuts defined earlier, namely *Layoff 10+ Percent* in Models (V) and (VI) and *Layoff* in Models (VII) and (VIII). The results are similar to those shown in Panel A, suggesting a significant reduction in the layoff-performance sensitivity for BLER firms during the crisis but not for other firms. As an additional robustness check, we estimated the models reported in Panel A over an extended time period (i.e. 2004-2012), added additional country-years fixed effects, and replaced ROA with value added as a measure of firm performance. The (untabulated) coefficients for the key variables remained unaffected.

Table 4 about here

Our base case estimator for Table 4 is an ordinary least squares (OLS) estimator (linear probability model). We choose the linear probability model rather than probit for consistency between the main result and

the robustness checks (i.e. the models using *Layoff* as the dependent variable) and for the sake of an easier interpretation of interaction terms (e.g. Ai and Norton, 2003). To ensure reliability of our statistical inferences, we allow standard errors to cluster at the firm level. To address the unobserved heterogeneity problems, we control for a range of firm characteristics that vary over time and, in most of our specifications, include firm-fixed effects. Moreover, we define our variable BLER as of 2007 (i.e. $BLER_{2007}$). This should limit reverse-causality issues as the Great Recession was unanticipated by most observers, meaning that crisis expectations should not have influenced the distribution of BLER across the firms before the crisis (e.g., Lins et al., 2013). Yet, as our identification strategy builds on the cross-sectional distribution of employee representation, some concerns remain. We therefore undertake a few additional steps to validate our results. Specifically, we acknowledge that the employee representation dummy (*BLER*) might relate to some other firm characteristics that could, theoretically, also explain the reduced performance-sensitivity of employment cuts during the crisis, such as family control, ownership concentration, regional characteristics, firm size and union density[17]. The results of these tests, all of them including time- and firm-fixed effects, are reported in Table 5.

In Models (I) and (II), Table 5, we check whether BLER is capturing the effect of family or other long-term owners. As previously mentioned, families and other long-term shareholders might be more inclined to incorporate employee interests in their decisions, regardless of whether workers are represented on the board or not. To control for this, we include triple interaction term *Family x ROA x Crisis* in Model (I) and *Block x ROA x Crisis* in Model (II), as well as the corresponding double interaction terms (the coefficients for the latter are not tabulated for the sake of space). In Model (III), we allow for the possibility that the BLER is capturing regional effects, thereby including a triple interaction term (*Capital Location x ROA x Crisis)*. Along similar lines, we address size effects and in Model (IV) include a triple interaction term including the dummy *Large Firm,* which identifies firms employing at least 250 employees (*Large Firm x ROA x Crisis*). None of the added triple interaction terms turns out to be significant, nor does including them alter the coefficients of the main variable of interest.

Table 5 about here

[17] Except for union density, there are no large differences in the distribution of BLER across the subsamples defined by these firm characteristics. BLER is observed in 51.3% of firms without family or other long-term owners and in 59% of the firms where such owners are in control. BLER is present in 40% of firms with moderate (low) union strength and in 60% of firms with high union strength. About 53% of firms with their headquarters outside the capital regions have employee directors on their boards, compared to 49% of firms in the capital regions.

Finally, in Model (V), Table 5, we address the relationship between labor unions and employee board representation, and implications for the results presented above. Economists have long debated the unions' preference set and the relative weighting that the unions give to wages and employment within this set. Consequently, three different models of union behavior have been proposed in the literature, i.e. the Monopoly Union Model, in which unions unilaterally set wages and employers adjust the employment accordingly, the Right-to-Manage Model, in which unions and employers bargain over the wages and employers then set the employment unilaterally, and the Efficient Bargaining Model, which assumes that unions and employers bargain over the wages and employment, thereby allowing for the emergence of cooperative outcomes in union-employer bargaining (Gahan, 2002). The latter two models have found support in the empirical literature, with more recent evidence suggesting that unions might become involved in efficient bargaining when facing the probability of employment reductions in hard economic times (Gahan, 2002; Lawson, 2011). At the same time, union density is found to be positively associated with the BLER dummy in our sample, although the relationship is not statistically significant. However, a positive correlation between union density and BLER has previously been supported in the literature, although evidence from Scandinavia suggests that this relationship might be weaker in larger and older firms (e.g. Gregoric and Poulsen, 2017). Given these observations, further checks are needed to demonstrate that BLER is not simply a proxy for stronger union density in the BLER firms.

To address this, in Model (V), Table 5, we include the triple interaction term for union density (*Unionization x ROA x Crisis*). As shown in the table, this triple interaction term in the layoff specifications is neither statistically significant, nor alters the significance or size of our key coefficient of interest (*BLER x ROA x Crisis*). This result is not particularly surprising, for a number of reasons. *First*, the union density is overall very high in Scandinavia, at 69.5 percent in Denmark, 44 percent in Norway and 64 percent in Sweden, on average. The low variation in union density across firms might also explain the insignificant coefficient for *Unionization* reported in Table 3 above. *Second*, as argued above, unions presumably played a strong role in negotiating sectoral and central agreements that facilitated and directed plant-level adjustments; the latter fell within the domain of the local actors, often at higher organizational levels (i.e. the board of directors)[18].

[18] We run one more check here. Specifically, we divide the companies into those operating in industries with below-average union density and those operating in industries with above-average (high) union density, using the simple average sector-level union density values provided in Andersen et al. (2014) and assuming an equal distribution of firms between sectors. The effect of BLER is found to be stronger in the firms with below-average union density than in those with high union density. These results are somewhat expected, as the marginal utility of having an employee board representative is probably lower in industries with stronger unions, where sector-level agreements might have resulted in a wider adoption of cooperative solutions, even in the firms without employee representation on their corporate boards.

4.3 Board-level employee representation and labor-cost adjustments as an alternative to layoffs

In the previous section we established that BLER firms were associated with a significantly lower sensitivity of dismissals to firm performance during the crisis. Considering the minority representation of employees on the board of directors, the tradition of Scandinavian codetermination, and insights from the theoretical literature, we have attributed this effect to the employee directors' ability to facilitate the negotiation of cooperative (integrative) adjustments to the crisis, namely solutions that provided employment security in exchange for workers' concessions in the form of reduced work-time and other measures. In line with this, anecdotal and case evidence from Scandinavia suggests that, indeed, the higher job security during the crisis was ensured by alternative measures of reducing labor costs, such as temporary layoffs, work-sharing agreements, and employee wage concessions. While we cannot observe these measures directly, it is reasonable to assume that they should all lead to a reduction of the total labor costs at the given level of employment. Consequently, we next test whether there is a significant association between the reduced layoff propensity of BLER firms and the adjustment of labor cost per employee in these firms during the crisis. The results of these tests are reported in Table 6, where the dependent variable is the relative change in labor costs per employee between t and (t+1). Since we are interested in the labor cost adjustments in BLER firms during the crisis, we estimate these regressions using the subsample of BLER firms during 2008-2009.

We perform three steps. *First*, we estimate three versions of the regression from specification I, Table 4, Panel A: (i) an OLS regression using *Layoff* as the dependent variable[19], and probit regressions using (ii) *Layoff 5+ Percent* and (iii) *Layoff 10+ Percent* as the dependent variable. In all three cases, we restrict the sample to non-BLER firms and the 2008-2009 period. *Second*, we use the estimated coefficients from these estimations to form predictions about what the *ceteris paribus* workforce reductions might have been in BLER firms, if they had behaved as non-BLER firms during the crisis period. Based on these predictions, we define *excess employment* by the variable *ExcessEmployment, (ExcessEmployment(5 perc) and ExcessEmployment(10 perc)*, thereby capturing the difference between the estimated layoffs that BLER firms might be assumed to have implemented if they had behaved as comparable non-BLER firms did during the crisis and the actual employment reductions in BLER firms. As such, a higher value of *ExcessEmployment* means that, ceteris paribus, the BLER firm has lower layoffs and thus higher employment than its non-BLER peer. *Finally*, we regress the relative changes in labor costs per employee (in percent) on our measures of *Excess Employment* for the subsample of BLER firms over the 2008-2009 period and report the results in Table 6.

[19] Remember that *Layoff* measures negative employment growth.

Table 6 about here

As indicated in Table 6, Panel A, Model (I), higher *Excess Employment* (i.e. lower workforce reductions) during the crisis associates negatively with the change in labor costs per employee. Specifically, on average a one percent higher employment is compensated by a 0.6 percent decrease in labor costs per employee. This result indicates that, indeed, the higher job security in BLER firms during the crisis was in part secured by alternative means of reducing labor costs, resulting in a decrease in the labor costs per employee. To corroborate this result, we next divide our sample of BLER firms into those operating in industries with high and moderate (low) unionization, using the simple mean of sector-level union density provided in Andersen et al. (2014), and assuming an equal distribution of firms between sectors. The results of Specifications II.a and II.b suggest that the compensation effect is higher (lower) in industries with low/moderate (high) levels of unionization. Combining the former results with extant evidence (e.g. Svalund et al., 2013), the lower sensitivity of labor cost adjustments to employment security in the industries with high union density could be explained by the higher bargaining power of the employees and, likely, measures introduced through sector-level agreements. Finally, we re-estimate Models (I) and (II) using alternative measures of *Excess Employment*, namely *ExcessEmployment(5 perc) and ExcessEmployment(10 perc)*[20]. The reported results in Specification III and IV again confirm that the higher job security in BLER firms during the crisis was in part secured by alternative means of reducing labor costs, thereby allowing labor costs reductions to be made without significant employment cuts.

5 Conclusion

In this paper we have argued that employee representatives on the board of directors are instrumental in the adoption of integrative measures of labor cost adjustment during a crisis. Using the shock of the Great Recession, and a longitudinal sample of Scandinavian firms, we have found empirical support for these propositions. We have shown that the reported effects are robust across different specifications, samples and dependent variable specifications. The firms with BLER are associated with lower sensitivity of employment cuts to firm performance during the crisis; we have shown that this lower sensitivity was in part ensured through downward adjustments in the labor costs per employee, presumably through the implementation of flexible time agreements, reorganizations of bonus systems, temporary layoffs and work-sharing agreements.

[20] In an unreported test, we also re-estimated Specification I by adding interaction terms between *Block*, *Capital* and *Unionization*, and *ExcessEmployment*. Our main results remained unaffected.

The reported results are in line with the overall idea of employee board representation in Scandinavia, where this mechanism of employee voice historically emerged as a contract between the employees and the shareholders for the purpose of aiding long-term competitiveness and firm growth (Jackson, 2005). Accordingly, the employees in Scandinavian firms are granted a minority of board seats, and these seats can be filled only by those employed by the company or the business group to which it belongs. Thus, they should have the motivation to cooperate with rather than resist the shareholders, and this might hold both in good and bad economic periods. Considering these and other characteristics of Scandinavian economies (e.g. small open economies, relatively high unionization and unemployment subsidies), any generalization of our results to other countries, such as Germany, should be made with caution. Regardless, our study provides novel evidence on the benefits of employee board representation in improving firm decisions, thereby complementing Fauver and Fuerst (2006), among others. While further research is necessary to corroborate this, our findings also indicate that more stakeholder-oriented governance may eventually pay off in the case of global shocks, as was the case in the Great Recession.

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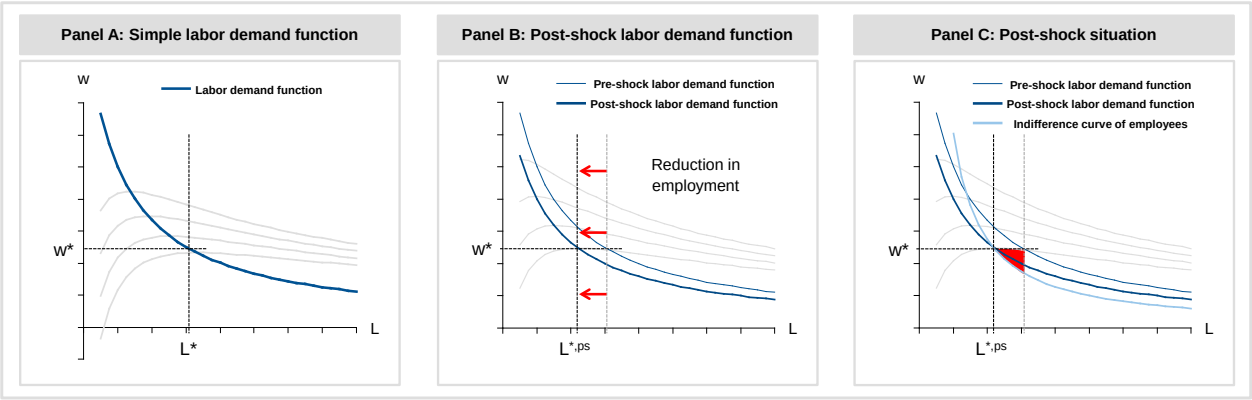
Figures and Tables

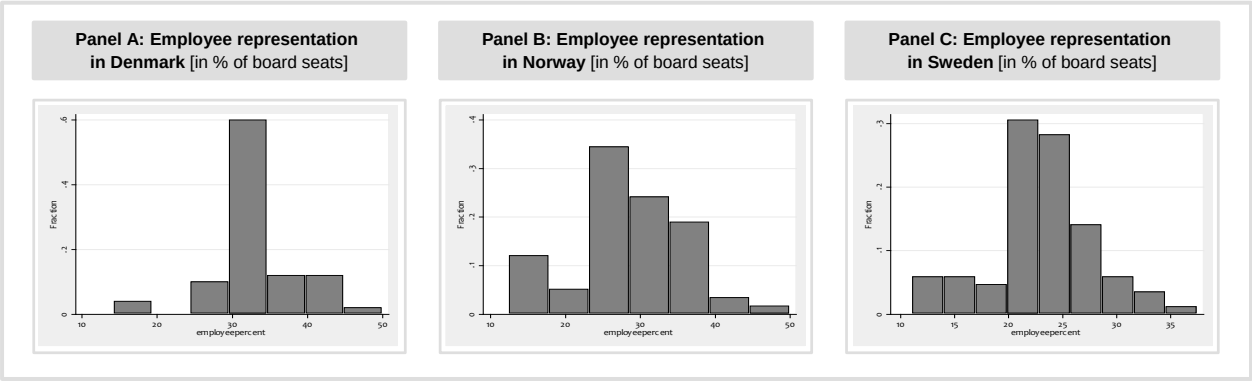
A. Figures

Figure 1: Illustrating labor demand functions



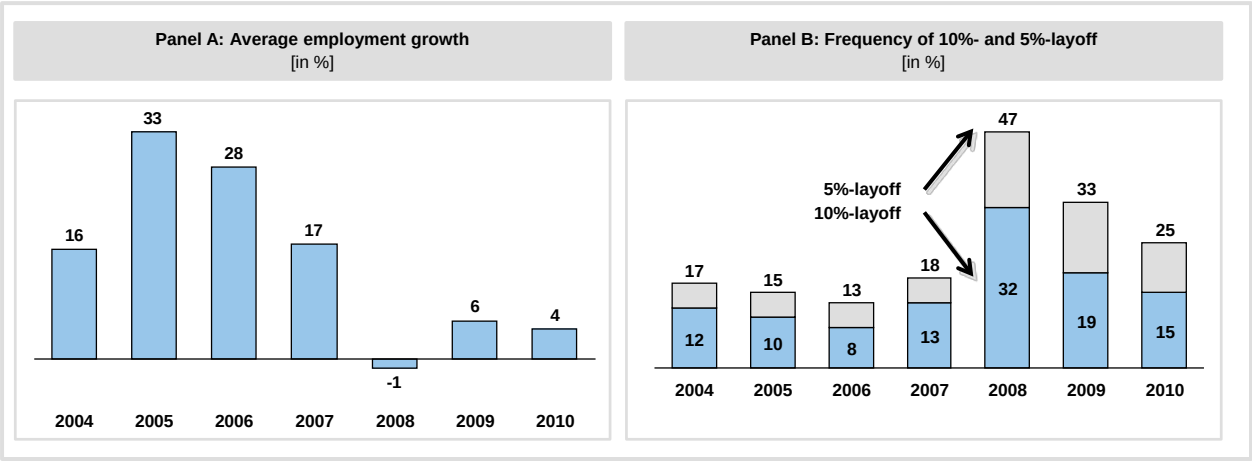
Notes: This figure illustrates labor demand functions and crisis responses in our model. While Panel A illustrates the labor demand function in an undistorted equilibrium situation (pre-crisis), Panel B illustrates the post-shock labor demand function (assuming employment reduction to be the only available response path) and Panel C illustrates the potential improvement to be gained from more general crisis responses.

Figure 2: Distribution of firms by share of employee-elected board members, by country



Notes: This figure illustrates the empirical distribution of the relative importance of employee-elected board members in each of the countries studied (measured as the fraction of board members that are elected by employees) within our sample of non-financial listed firms.

Figure 3: Development of employment and layoff decisions over time



Notes: This figure illustrates the development of employment (Panel A) and the frequency of layoff decisions (Panel B) within our sample of non-financial listed firms. Panel A reports the average annual employment growth over all firms. Panel B reports the fraction of firms reducing employment by at least 5 percent (10 percent) per year.

B. Tables

Table 1: Variable definitions and sources

Variable label	Variable description	Source
Board-level employee representation		
BLER	Dummy for having (at least one) employee-elected director on the board (in 2007)	Annual reports and corporate websites
Relative BLER (%)	Share of all board seats held by employee-elected directors (measured in 2007)	Annual reports and corporate websites
Crisis decisions		
Layoff 5+ Percent	Dummy for firm years in which the firm reduces its laborforce by at least 5 percent	Own calculation based on Thomson/Reuters Worldscope
Layoff 10+ Percent	Dummy for firm years in which the firm reduces its laborforce by at least 10 percent	Own calculation based on Thomson/Reuters Worldscope
Layoff	Variable measuring layoffs defined as a censored (at zero) variable measuring negative employment growth	Own calculation based on Thomson/Reuters Worldscope
Labor Costs per Employee	Total salary and benefit expense standardized by number of employees	Own calculation based on Thomson/Reuters Worldscope
Accounting-based firm characteristics		
Firm Size	Logarithm of total assets (measured in 000 USD)	Thomson/Reuters Worldscope
ROA	EBIT standardized by total assets (in %)	Own calculation based on Thomson/Reuters Worldscope
Tangibility	Net property, plant and equipment standardized by total assets (in %)	Own calculation based on Thomson/Reuters Worldscope
RnD	Research and development expenses standardized by total assets (in %)	Own calculation based on Thomson/Reuters Worldscope
Leverage	Short- and long-term debt standardized by total assets (in %)	Own calculation based on Thomson/Reuters Worldscope
Other firm and governance characteristics		
Capital Location	Dummy for firms headquartered in the capital region	Own calculation based on Bureau van Dijk data
Age	Firm age (number of years in logarithms)	Own calculation based on Bureau van Dijk data
CEO	Board Composition Proxy 1, measuring whether the CEO is a member of the board of directors	
Blockholder	Fraction of ownership owned by largest blockholder (in %)	Bureau van Dijk
Family	Dummy for firms controlled by families or an owner with disproportional control rights	Annual reports and corporate websites

Notes: This table reports definitions and sources of our main variables. All variables are winsorized on an annual basis at the 1% level.

Table 2: Descriptive statistics

Variable	Full sample								BLER = 0			BLER = 1			Diff
	N	Mean	SD	Min	P25	Median	P75	Max	N	Mean	SD	N	Mean	SD	
BLER	365	0.53	0.50	0.00	0.00	1.00	1.00	1.00	172	0.00	0.00	193	1.00	0.00	…
Relative BLER (%)	365	14.69	14.96	0.00	0.00	14.29	28.57	50.00	172	0.00	0.00	193	27.77	7.66	-47.53***
Size	365	12.44	1.89	8.11	11.06	12.33	13.60	17.41	172	11.67	1.65	193	13.13	1.81	-8.02***
Tangibility	365	79.98	18.59	24.55	69.24	84.42	96.56	100.00	172	79.61	19.77	193	80.30	17.52	-0.35
RnD	365	2.84	7.04	0.00	0.00	0.00	1.82	39.09	172	2.93	7.06	193	2.75	7.04	0.25
ROA	365	4.88	18.34	-92.78	2.09	7.27	12.91	70.02	172	1.98	20.24	193	7.46	16.08	-2.88**
Leverage	365	22.84	18.36	0.00	6.94	19.89	37.14	73.74	172	20.56	19.11	193	24.86	17.47	-2.25*
Age	365	3.12	0.84	1.10	2.64	3.00	3.74	4.71	172	2.88	0.73	193	3.34	0.87	-5.39***
Family	343	0.21	0.41	0.00	0.00	0.00	0.00	1.00	161	0.18	0.39	182	0.24	0.43	-1.27
Block	365	51.42	24.54	0.00	32.80	53.70	72.86	93.82	172	46.91	25.67	193	55.45	22.80	-3.36***
CEO	365	0.32	0.47	0.00	0.00	0.00	1.00	1.00	172	0.30	0.46	193	0.33	0.47	-0.72
Capital Location	365	0.54	0.50	0.00	0.00	1.00	1.00	1.00	172	0.59	0.49	193	0.49	0.50	1.82
Unionization	365	60.50	18.49	2.00	48.00	57.00	79.00	80.00	172	57.80	18.66	193	62.91	18.05	-2.66**
BLER Industry	365	42.09	22.01	0.00	25.00	42.86	55.56	88.89	172	37.03	20.51	193	46.59	22.37	-4.24***
BLER Region	365	50.90	14.19	0.00	42.73	45.65	56.90	100.00	172	50.37	12.96	193	51.36	15.22	-0.66

Notes: This table reports descriptive statistics for our main variables in our last pre-crisis year, i.e. 2007. All variables are symmetrically winsorized at the 1% level, with the exception of BLER and Relative BLER (%). All variables are described in detail in Table 1.

Table 3: Determinants of BLER

Dependent variable		BLER			Relative BLER (%)
Method		Probit			OLS
Sample			All firms in 2007		
Specification	I	II	III	IV	V
Size	0.317***	0.334***	0.317***	2.254***	2.481***
	[5.50]	[5.69]	[5.77]	[5.02]	[5.08]
Tangibility	-0.006	-0.007	-0.007*	-0.039	-0.063*
	[-1.21]	[-1.39]	[-1.68]	[-0.95]	[-1.67]
RnD	0.029**	0.029**	0.023*	0.215**	0.210*
	[2.24]	[2.14]	[1.86]	[1.98]	[1.85]
ROA	0.001	0.003	0.002	0.036	0.052
	[0.20]	[0.45]	[0.47]	[0.84]	[1.19]
Leverage	-0.003	-0.006	-0.006	-0.014	-0.061
	[-0.62]	[-1.09]	[-1.34]	[-0.30]	[-1.35]
Age	0.352***	0.304**	0.343***	2.363**	2.955**
	[2.95]	[2.45]	[2.98]	[2.18]	[2.53]
Family		-0.276	-0.154		-2.817
		[-1.19]	[-0.79]		[-1.54]
Block		0.011***	0.008**		0.078**
		[3.03]	[2.28]		[2.55]
CEO			-0.073		-1.631
			[-0.39]		[-0.94]
Capital Location			-0.399**		-2.682
			[-2.23]		[-1.62]
Unionization			0.001		0.066
			[0.22]		[1.15]
BLER Industry			0.013***		0.093***
			[3.49]		[2.63]
BLER Region			-0.003		-0.009
			[-0.52]		[-0.14]
Industry effects	yes	yes	no	yes	no
Country effects	yes	yes	yes	yes	yes
Observations	351	329	329	365	343
Adj.R^2				0.259	0.230

Notes: This table reports cross-sectional probit and OLS regressions that correlate BLER status and Relative BLER (%) in 2007, our last pre-crisis year, with firm and governance characteristics, as well as industry and geographic characteristics. All variables are described in detail in Table 1. Numbers in brackets are t-values robust to heteroscedasticity. *p<0.10 **p<0.05 ***p<0.01.

Table 4: Layoff regression

Panel A: Layoffs larger than 5 percent

Dependent variable		**Layoff 5+ Percent**		
Method		**OLS**		**Fixed effects**
Sample	**BLER=0**	**BLER=1**	**All firms**	
Specification	**I**	**II**	**III**	**IV**
ROA	-0.004***	-0.006***	-0.003***	-0.004**
	[-3.69]	[-3.97]	[-3.67]	[-2.43]
ROAxCrisis	-0.002	0.005**	-0.002	0.000
	[-1.26]	[2.31]	[-1.35]	[-0.31]
BLERxROAxCrisis			**0.007*** **	**0.007** **
			[2.65]	**[2.30]**
BLERxCrisis			-0.053	-0.054
			[-1.07]	[-1.00]
BLER			0.052	0.000
			[1.60]	[.]
BLERxROA			-0.003	-0.003
			[-1.64]	[-1.01]
Size	0.020	-0.025**	-0.008	0.089*
	[1.53]	[-2.00]	[-0.88]	[1.86]
Tangibility	0.000	0.000	0.001	-0.001
	[0.14]	[0.25]	[0.66]	[-0.58]
RnD	-0.001	0.000	-0.002	0.004
	[-0.57]	[-0.15]	[-0.97]	[1.03]
Leverage	0.001	0.002*	0.001*	0.003**
	[0.73]	[1.82]	[1.79]	[2.12]
Age	-0.027	0.003	-0.010	0.289
	[-0.86]	[0.12]	[-0.53]	[1.49]
Block	0.000	0.000	0.000	-0.003**
	[-0.48]	[-0.26]	[-0.61]	[-2.34]
Firm effects	no	no	no	yes
Industry and country effects	yes	yes	yes	no
Year effects	yes	yes	yes	yes
Observations	699	901	1,600	1,600
Adj.R^2	0.11	0.13	0.11	0.13

Panel B: Alternative layoff measures

Dependent variable	**Layoff 10+ Percent**		**Layoff**	
Method	**OLS**	**Fixed effects**	**OLS**	**Fixed effects**
Sample		**All firms**		
Specification	**V**	**VI**	**VII**	**VIII**
BLERxROAxCrisis	**0.005****	**0.005****	**0.002***	**0.002***
	[2.40]	**[2.04]**	**[1.73]**	**[1.70]**
Other controls	yes	yes	yes	yes
Firm effects and year effects	yes	yes	yes	yes
Observations	1,600	1,600	1,600	1,600
Adj.R^2	0.07	0.07	0.06	0.06

Notes: This table reports panel data regressions that explain the performance sensitivity of firms' layoff decisions during the crisis over the 2005-2009 period, controlling for firm and governance characteristics. Panel A explains a dummy variable, *Layoff 5+ Percent*, indicating a layoff decision of at least 5 percent of the employees. Panel B reports results for alternative layoff measures. Thereby, while Specifications I-III, V, and VII include year- and industry-fixed effects, Specifications IV, V and VII also include firm-fixed effects. All variables are described in detail in Table 1. Numbers in brackets are t-values robust to heteroscedasticity and clustered at the firm level. *p<0.10 **p<0.05 ***p<0.01.

Table 5: Robustness: Layoff regression with additional interaction terms

Dependent variable			**Layoff 5+ Percent**		
Method			**Fixed effects**		
Sample			**All firms**		
Specification	**I**	**II**	**III**	**IV**	**V**
ROA	-0.005**	-0.004**	-0.005	-0.003	-0.009**
	[-2.35]	[-2.12]	[-1.63]	[-1.34]	[-2.09]
ROAxCrisis	0.000	0.004*	-0.002	-0.001	0.002
	[0.20]	[1.95]	[-0.61]	[-0.67]	[0.60]
BLERxROAxCrisis	**0.007****	**0.008*****	**0.006****	**0.006****	**0.007****
	[2.50]	**[2.79]**	**[2.09]**	**[1.97]**	**[2.35]**
BLERxCrisis	-0.051	-0.068	-0.057	-0.085	-0.051
	[-0.89]	[-1.27]	[-1.05]	[-1.55]	[-0.95]
BLERxROA	-0.003	-0.004	-0.003	-0.002	-0.003
	[-0.98]	[-1.22]	[-0.98]	[-0.76]	[-1.08]
FamilyxROAxCrisis	-0.002				
	[-0.79]				
BlockxROAxCrisis		-0.000**			
		[-2.47]			
Capital Location xROAxCrisis			0.002		
			[0.76]		
UnionizationxROAxCrisis					0.000
					[-0.79]
LargeFirmsxROAxCrisis				-0.002	
				[-0.47]	
Size	0.104**	0.100**	0.094**	0.088*	0.095*
	[2.17]	[2.15]	[1.97]	[1.86]	[1.95]
Tangibility	0.001	-0.001	-0.001	-0.001	-0.001
	[0.32]	[-0.37]	[-0.54]	[-0.60]	[-0.54]
RnD	0.005	0.006	0.004	0.004	0.004
	[1.35]	[1.59]	[1.30]	[1.10]	[1.18]
Leverage	0.003**	0.003**	0.003*	0.003**	0.003**
	[2.06]	[2.01]	[1.96]	[2.03]	[2.16]
Age	0.230	0.244	0.283	0.304	0.314
	[1.15]	[1.27]	[1.47]	[1.56]	[1.62]
Block	-0.003**	-0.003***	-0.003**	-0.003**	-0.003**
	[-2.31]	[-2.72]	[-2.31]	[-2.45]	[-2.32]
Firm effects	yes	yes	yes	yes	yes
Year effects	yes	yes	yes	yes	yes
Observations	1,521	1,600	1,600	1,588	1,600
Adj.R^2	0.129	0.139	0.132	0.136	0.130

Notes: This table reports firm-fixed effects panel data regressions that explain the performance sensitivity of firms' layoff decisions during the crisis over the 2005-2009 period, controlling for characteristics correlated with BLER status. Base effects and double interaction terms are not reported for the sake of space. All variables are described in detail in Table 1. Numbers in brackets are t-values robust to heteroscedasticity and clustered at the firm level. *p<0.10 **p<0.05 ***p<0.01.

Table 6: Layoffs and labor cost adjustments during the crisis

Dependent variable	Relative change in labor costs per employee (%)				
Method	OLS				
Sample	BLER firms only	BLER firms in industries with low level of unionization	BLER firms in industries with high level of unionization	BLER firms only	
Specification	I	II.a	II.b	III	IV
ExcessEmployment	-60.504***	-135.325***	-33.838**		
	[-2.85]	[-2.89]	[-2.35]		
ExcessEmployment(5 perc)				-8.803***	
				[-3.12]	
ExcessEmployment(10 perc)					-7.382**
					[-2.11]
ROA	0.095*	0.017	0.045	0.141**	0.137**
	[1.78]	[0.18]	[0.57]	[2.31]	[2.24]
Size	0.567	1.370	0.795	0.009	0.188
	[0.89]	[0.83]	[1.08]	[0.01]	[0.29]
Tangibility	-0.035	0.053	-0.098*	0.004	0.028
	[-0.60]	[0.49]	[-1.71]	[0.05]	[0.42]
RnD	0.164	0.216	-0.102	0.098	0.046
	[1.23]	[0.99]	[-0.35]	[0.53]	[0.23]
Leverage	-0.061	-0.074	-0.029	0.000	-0.026
	[-1.21]	[-0.71]	[-0.48]	[0.01]	[-0.47]
lnAge	-2.604**	-3.713	-2.315**	-1.875	-2.284*
	[-2.07]	[-1.28]	[-2.01]	[-1.39]	[-1.73]
Block	0.006	0.015	-0.031	-0.050	-0.017
	[0.15]	[0.13]	[-0.70]	[-1.14]	[-0.41]
Industry effects	yes	yes	yes	yes	yes
Country effects	yes	yes	yes	yes	yes
Year effects	no	no	no	no	no
Observations	310	131	179	271	277
Adj.R^2	0.321	0.406	0.270	0.298	0.278

Notes: This table reports cross-sectional regressions that explain relative labor cost adjustments in BLER firms as a function of the firms' layoff decisions during the crisis. Thereby, *ExcessEmployment* is the *abnormal* employment of a BLER firm relative to a ceteris paribus non-BLER firm derived in three steps. *First*, we use firm and governance characteristics as well as industry-fixed effects to explain the layoff decisions of non-BLER firms, where the latter are measured by *Layoff*, *Layoff 5+ Percent* and *Layoff 10+ Percent*. *Second*, we use the coefficients of these first-stage regressions and apply them to BLER firms to predict the *expected* layoff decision. *Third*, we define *ExcessEmployment* (*ExcessEmployment(5 perc)* and *ExcessEmployment(10 perc)*) as the difference between the *expected* layoffs and the actual layoffs. All other variables are described in detail in Table 1. Numbers in brackets are t-values robust to heteroscedasticity and clustered at the firm level. *p<0.10 **p<0.05 ***p<0.01.