

Collective Bargaining about Corporate Social Responsibility

Laszlo Goerke

IAAEU - Trier University*, IZA, Bonn and CESifo, München

goerke@iaaeu.de

Nora Paulus

IAAEU - Trier University*

paulus@iaaeu.de

September 20, 2021

Abstract:

If a firm can credibly commit to an employment-enhancing Corporate Social Responsibility (CSR) objective in negotiations with a trade union, the union can reduce its wage demands. Lower wages, *ceteris paribus*, raise profits, while the increase in employment enhances the payoff of a wage-setting trade union. Therefore, both the firm and the trade union can be better off in the presence of a collectively bargained CSR-objective than in its absence. Moreover, such Pareto-improvement can arise endogenously from collective bargaining. In consequence, CSR can mitigate the inefficiency arising from collective wage negotiations.

Keywords: Collective Bargaining, Corporate Social Responsibility, Employment, Pareto-Improvement, Trade Union, Wages

JEL Classification: D 60, J 51, M 14

*Institute for Labour Law and Industrial Relations in the European Union, Trier University, Campus II, D-54286 Trier, Germany

1 Introduction

Many firms pursue Corporate Social Responsibility (henceforth: CSR) objectives. While there is no universally accepted definition, the general agreement seems to be that CSR-activities can include community concerns, environmental aspects, consumer relations, product-related aspects, human rights, and employee relations. As activities in any of the domains are costly, a major issue in the analysis of CSR is whether firms forego profits by behaving in a socially responsible manner, or whether taking into account CSR concerns is a means to augment them. One line of argument in the discussion about profit-enhancing or strategic CSR-activities has focused on the question of whether CSR can help firms to commit to a particular output market behaviour. Another approach has considered consequences for the consumers' willingness to pay. A further strand of contributions has argued that CSR can increase employee productivity. The role of trade unions, however, has been widely neglected (Jackson *et al.*, 2018). This is surprising because collective bargaining is prevalent for an overwhelming fraction of the workforce in many OECD and European Union member states (Visser, 2019). Moreover, collective bargaining is most likely to occur in large firms (OECD, 2019, p. 47), for which CSR activities have been widely documented (KPMG, 2017).

In this paper, we argue that collective bargaining makes a credible commitment to an employment-enhancing CSR-objective feasible. The trade union has an incentive to ensure that the firm sticks to its promise because it benefits from higher employment. Moreover, it can force the firm to adhere to its commitment since it can call a strike or induce employees to reduce effort and work to rule. If the resulting reduction in profits, for example in the case of a strike, exceeds the direct detrimental impact of the CSR-objective, the firm will adhere to its promise. Given the resulting expansion in employment, the trade union is better off by a reduction of the bargained wage to below the level which results in the absence of CSR-activities. If the CSR-objective is not too important for the firm's employment decision, profits may rise due to the wage effect. In consequence, a collectively negotiated CSR-objective may not only enhance profits, such that a firm favours its introduction, but can give rise to a Pareto-improvement. The main mechanism which causes this positive welfare effect is that an employment-enhancing CSR-objective introduces an element of efficient bargaining into wage negotiations. Therefore, CSR activities can mitigate the inefficiencies on the input market, and can help to share the ensuing gains between the firm and its employees.

Trade union representatives often appear to view companies' CSR activities sceptically. Frequently, they regard them as a substitute for bilateral agreements and statutory provisions or as an attempt to weaken the union's influence and bargaining power (Preuss *et al.*, 2006; Preuss, 2008). Moreover, at least initially there was the conjecture that CSR activities solely form part of a firm's PR-strategy.¹ Our analysis clarifies that such worries need not be justified

¹See, for example, the statements by the German Trade Union Federation (Deutscher Gewerkschaftsbund,

if trade unions play a distinct role in the implementation of CSR activities, which provide firms with an immediate interest in the union's co-operation.

In the further course of the paper, we discuss related contributions in Section 2 and set out the analytical framework in Section 3. Section 4 contains our main analysis and discusses some extensions of the basic framework. Section 5 summarises and provides concluding remarks.

2 Related Literature

Our analysis is related to at least four, partly complementary strands of literature. The first considers a firm's incentives to pursue a CSR-objective in order to raise profits. The second looks at labour-related CSR-objectives. Thirdly, we can compare our results to those of collective bargaining analyses about wages and a second component, such as employment or dismissal pay. Finally, there are studies, which presume that trade unions help firms to commit to *prima facie* non-optimal behaviour.

CSR-activities usually imply that a firm deviates from profit-maximising behaviour. Nonetheless, pursuing a CSR-objective can imply that the direct negative profit impact is compensated by higher revenues or a decline in costs. In consequence, profit-maximising firms may have a strategic incentive to pursue a CSR-objective. Such an outcome could come about if CSR constitutes a device by which firms can commit themselves or induce other firms to a different behaviour on a non-competitive output market than they would have chosen in the absence of CSR (Goering, 2014; Manasakis *et al.*, 2014; Brand & Grothe, 2015). This commitment may also require the delegation of decisions to managers whose choices are altered by CSR-objectives (Kopel & Brand, 2012; Manasakis *et al.*, 2014; Fanti & Buccella, 2017b). Alternatively, CSR may increase the consumers willingness to pay (Lee & Jung, 2016; Fanti & Buccella, 2018), especially in the presence of social comparisons and oligopolistic markets (Iyer & Soberman, 2016), allow firms to take adverse environmental production effects into account (Lambertini & Tampieri, 2015; Lambertini *et al.*, 2016), deter entry by potential competitors (Planer-Friedrich & Sahn, 2020), or reduce the costs of external funding (Heinkel *et al.*, 2001). In this paper, we focus on labour costs and show that CSR may lower bargained wages and, thus, raise profits.

Analyses of the role of labour in the context of a firm's CSR activities have mostly focused on individual employees. Those individuals for whom CSR-objectives, such as producing in an environmentally-friendly manner, have a greater importance, self-select into firms with such objectives (Greening & Turban, 2000; Brekke & Nyborg, 2008; Non *et al.*, 2021). They may also change their behaviour in other ways, such that labour costs decline. Most contributions

2009, p. 4) that "voluntary CSR commitments must not amount to corporate cosmetics" and by the British Trade Union Congress (TUC) in 2001: "Independent verification would help to ensure that ... (CSR reports) were true and based in fact, rather than simply being a public relations exercise by the company's communications department." (quoted in Preuss *et al.* (2006, p. 260)).

investigating this kind of argument have an empirical orientation. They, *inter alia*, consider the impact on wages (Bolvig, 2005; Burbano, 2016; Nyborg, 2014; Nyborg & Zhang, 2013; Newman *et al.*, 2020), application rates (Hedblom *et al.*, 2019), turnover (Carnahan *et al.*, 2017), effort (Brekke & Nyborg, 2008; Koppel & Regner, 2014; Hedblom *et al.*, 2019), and employee misbehaviour (List & Momeni, 2021). Relatedly, Flammer & Luo (2017) show that higher unemployment benefits make shirking or absenteeism more likely and that firms counteract such behavioural changes by expanding employee-related CSR activities. In contrast to these investigations in which CSR affects an individual's incentives, in our analysis it does so at the collective level.

The contributions that consider the role of trade unions in firms with CSR-objectives, have a stronger theoretical focus. In two related studies, Fanti & Buccella (2019, 2020) investigate a Cournot-duopoly and, hence, combine two distortions: Imperfectly competitive input and output markets. Assuming a trade union that sets a uniform wage, Fanti & Buccella (2019, 2020) show that adopting a CSR-objective commits firms to higher output and, thus, enables them to pay lower wages such that profits rise. The increase in output ensures that also consumers and workers benefit.² In contrast to Fanti & Buccella (2019, 2020), Goerke (2021) assumes that the firm's CSR-objective is exogenously given. He compares wage bargaining and efficient negotiations in the presence of two different CSR-objectives. The present contribution differs from Fanti & Buccella (2019, 2020) and Goerke (2021) as the firm is unable to credibly commit to a CSR-objective and requires the union to induce workers to adjust their wage demands.

A number of recent analyses consider the impact of union density on the extent of CSR objectives empirically. For the United Kingdom, Boodoo (2020) reports a positive correlation for employee-oriented CSR-objectives and a U-shaped one for CSR-scores, which do not focus on the workforce. The evidence for the United States is mixed: While Ertugrul & Marciukaityte (2021) observe a negative impact of unionisation on the extent of CSR-reporting, Chantziaras *et al.* (2021) find the opposite outcome. In Chen *et al.* (2021) the direction of the correlation between CSR-spending and unionisation depends on industry characteristics and on whether the expenditure is employee-related or not. Turning to cross-country evidence, Ioannou & Serafeim (2012) show a positive correlation between union density and CSR activities. Liang & Renneboog (2017) focus on the relationship between CSR and a country's legal origin. In this context, they, *inter alia*, establish a positive correlation between measures of employment laws and collective bargaining, that is, indicators of the trade unions' bargaining power, on the one hand, and CSR on the other. In sum, the extant empirical research is suggestive of a positive effect of the strength of trade unions on CSR activities.³

²In a further set of papers, the authors analyse settings in which there is collective bargaining, while the output market exhibits network effects, and show that CSR can enhance profits (see, for example, Fanti & Buccella (2017a, 2021)).

³Scholz & Vitols (2019) focus on board-level co-determination in Germany and observe no correlation with symbolic CSR-policies, and a positive correlation with costly or, in their terminology, substantive CSR-activities.

Our analysis is also related to investigations, which assume collective bargaining about wages and a second component. While the firm continues to determine employment, the second element of collective negotiations decouples the firm's marginal costs of employment from the income of workers, as it can also be the case in the presence of a CSR-objective. Hence, it is feasible to achieve an efficient bargaining outcome. The second income source for workers may be a share of profits (Pohjola, 1987; Anderson & Devereux, 1989; Jerger & Michaelis, 1999)⁴, severance pay (Booth, 1995; Pita, 1997) or, more generally, the non-wage component of a two-part remuneration structure (Appelbaum, 2011). Therefore, these analyses differ from our set-up in which employment is still determined by the bargained level of wages. Accordingly, also the mechanisms diverge, which affect profits and union utility.

Finally, we take up the idea that trade unions can help firms to commit to a particular behaviour. Malcomson (1983) assumes that the firm and employees are risk-averse and that revenues are uncertain. Hence, the efficient contract is generally state-contingent. Given informational asymmetries, such contracts are not enforceable in court. Therefore, firms have an incentive to ex-post renege on the promise of an income insurance for employees. Trade unions can help to commit to state-contingent contracts in Malcomson's (1983) setting because they impose costs on the firms, for example, by calling a strike, if firms do not adhere to their contractual obligations (see also Hogan 2001 and Eguchi 2002).⁵ Dustmann & Schönberg (2009) consider a two-period setting in which training can take place in the first period and enhances productivity in the second. Higher wages raise the probability that a trained workers stays with the firm, such that training actually pays off. Since productivity is observable ex-post, the firm always has an incentive to reduce the wage in period two and training will not take place. A trade union can help firms to commit to high wages in period two, thus raising the probability that workers stay and alleviating the incentives to train workers (see also Booth & Chatterji, 1998). In contrast to these investigations, the present one presumes that the trade union establishes ex-ante credibility for the firm's ex-post employment choice.

In sum, the firm's incentives to bargain over the strength of a CSR-objective with a trade union to credibly establish an increase in labour demand have to the best of our knowledge not been looked at before.

3 Model

3.1 Set-up

We consider a framework in which a firm-specific, utilitarian trade union sets the wage and the firm subsequently chooses employment. The firm's ultimate objective is to maximise profits.

⁴The idea is implicit already in Atkinson (1977).

⁵Kim *et al.* (2018) present evidence that parity co-determination in large firms in Germany makes a firm's promise to shelter employees from employment fluctuations more credible.

Prior to the standard collective wage bargaining game, the relevance of CSR for the firm's output choice is determined. In particular, the CSR-objective induces the firm to choose a higher level of output and, thus, employment than if it maximised profits. The trade union can respond to the resulting increase in its payoff by lowering the wage. Therefore, the firm may have a profit-based incentive to distort its employment decision.

A unilateral commitment by the firm to a CSR-objective is not credible, once the wage has been set by the trade union. The reason is that profits are higher if the firm ignores the CSR-objective in its employment choice than if it adhered to its commitment. Therefore, a firm always has an incentive to renege on any promise relating to a non profit-maximising employment level. To account for this credibility issue, we assume that a commitment to a CSR-objective is costly.⁶

Denoting the strength of the CSR-objective by γ (with $\gamma \geq 0$), the firm can credibly commit to its importance, γ^{uni} , in the choice of employment in a unilateral manner at costs $K^{uni}(\gamma)$, where $K^{uni}(0) = 0$, $K^{uni}(\gamma > 0) > 0$, and $\frac{dK^{uni}(\gamma)}{d\gamma} = K^{uni'}(\gamma) \geq 0$ hold true.

As an alternative to a unilateral and costly commitment, the trade union and the firm can bargain about the importance of the CSR-objective, γ^{bar} . We assume that the costs of such bargained commitment, $K^{bar}(\gamma)$ (with $K^{bar}(0) = 0$, $K^{bar}(\gamma > 0) \geq 0$, and $K^{bar'}(\gamma) \geq 0$) are lower than if the firm unilaterally sets γ . More precisely, $K^{uni}(\gamma) > K^{bar}(\gamma)$ holds true for any given value of $\gamma > 0$. This difference in commitment costs occurs because the trade union can impose costly sanctions, such as strikes, work-to-rule behaviour, dismissal payments in case of employment reductions, or lengthy and costly labour court procedures, if the firm does not adhere to its promise. Therefore, a commitment to an employment choice in excess of the profit-maximising level is possible at lower costs than if the firm unilaterally determined γ .⁷

Subsequently, we derive the conditions, which ensure that the firm and the trade union benefit from the existence of a bargained CSR-objective, such that a Pareto-improvement can result. We also enquire what the firm's preferred strength, γ^{max} , of the CSR-objective would be, if it faced no commitment costs. This hypothetical outcome helps to evaluate the bargained level, γ^{bar} , of the relevance of the CSR-objective.

3.2 Trade Union

The trade union maximises the utility of its M members. As usual, membership exceeds employment. N employed union members obtain the wage, w , while the remaining $M - N$

⁶See Manasakis *et al.* (2013) for the basic idea. The authors analyse the impact of alternative types of certification institutions, which are characterised by different objectives, on the costs of commitment and CSR activities in an oligopolistic market.

⁷There is a complementary perspective according to which CSR activities initiated by employees have stronger productivity effects than if enacted by firms (see, for example, Bhattacharya *et al.* (2008)). As in our setting focussing on collective representation, employee involvement enhances the potential for positive profit effects of CSR.

members receive an alternative income, denoted by $\bar{w} > 0$. All members are ex-ante identical, and their utility function, u , is increasing in its argument at a weakly decreasing rate, $u' > 0, u'' \leq 0$. Therefore, the union's objective, U , is (Oswald, 1985):

$$U = Nu(w) + (M - N)u(\bar{w}) \tag{1}$$

3.3 Firm

The firm maximises profits, π . Revenues, $F(N)$, are increasing in employment, N , at a decreasing rate and zero if no labour input is used, implying that $F(0) = 0$, and $F'(N) > 0 > F''(N)$ hold true for $N > 0$. The firm's only operating costs are due to wages. Therefore, profits in the absence of commitment costs are given by:

$$\pi(N) = F(N) - wN \tag{2}$$

The firm's employment decision deviates from the profit-maximising level because it pursues a CSR-objective. This objective can relate to a multitude of aspects (Kitzmueller & Shimshack, 2012). If the firm, for example, manufactures a product which is harmful to the environment or uses non-renewable resources, it may gain from a reduction in the detrimental environmental consequences of its behaviour (Lambertini *et al.*, 2016). If the firm has market power and produces a smaller output level than defined by the equality of marginal costs and price, it may benefit from an expansion of production. This is often assumed in monopolistic markets (Goering, 2008) or oligopoly settings (Planer-Friedrich & Sahm, 2020). In our context with collective wage determination, the benefits of the firm's employees may also be relevant (Goerke, 2021).

We do not restrict our attention to a particular CSR-objective and assume an encompassing specification. In particular, the CSR-objective is increasing in employment, N , and, thus, output. Therefore, the CSR-objective is given by $C(N)$, where $C(0) = 0$ and $C'(N) = (>) 0$ apply for $N = (>) 0$. The general specification, $C(N)$, incorporates the possibility that the CSR-objective relates to employment ($C' = 1$), revenues or output ($C(N) = F(N)$), or consumer surplus, respectively, consumer orientation (i.e., $C(N) = 0.5N^2$, in case of a linear demand schedule $P = a - N, a > 0$, a linear production function and the firm being the sole producer of the good).

For later use, we define the elasticity of the slope of the CSR-objective with respect to employment.

$$\kappa = \frac{dC'(N)}{dN} \frac{N}{C'(N)} \quad (3)$$

The elasticity, κ , is zero if the CSR-objective is linear in employment (for $N > 0$) and it is negative if $C(N)$ is strictly concave in N .

The firm's employment choice results from the maximisation of the weighted sum of profits, π , and the CSR-objective, $C(N)$. We denote this objective by Z and, once again, do not incorporate commitment costs into the specification:

$$Z(N) = \pi(N) + \gamma C(N) = F(N) - wN + \gamma C(N) \quad (4)$$

3.4 Importance of CSR-Objective and Sequence of Decisions

In the first stage, the firm and the trade union Nash-bargain over the importance of the CSR-objective in the firm's employment decision. Since the firm's costs of credibly committing to an according employment choice in a bargain with the trade union are lower than if the firm unilaterally decided on γ , we normalise the costs of this collectively bargained commitment to zero ($K^{bar}(\gamma) = 0$). To simplify the analysis further, we assume that the firm's costs of unilaterally making a credible commitment are prohibitive ($K^{uni}(\gamma > 0) \rightarrow \infty$).⁸

The firm's payoff in the case of an agreement equals $\pi(\gamma) = \pi(N(w(\gamma), \gamma), w(\gamma))$. The payoff if there is no agreement is given by the level of profits, which result for $\gamma = 0$. This is because the trade union will not adjust the wage if there is no binding agreement on the importance of the CSR-objective. The firm anticipates this kind of union behaviour and, therefore, knows that in case of no agreement it has to pay the wage that results if $\gamma = 0$ applies. We denote these profits by $\pi(0)$. In line with the above argument, the trade union's payoff in the absence of an agreement about γ is given by the utility, $U(0)$, it would attain if there was no CSR-objective, and labelled $U(\gamma)$ otherwise. The bargaining power of the trade union (firm) in the Nash-bargain about the CSR-objective equals μ ($1 - \mu$), $0 \leq \mu \leq 1$.

Collecting the above assumptions, the Nash-product determining the strength of the CSR-objective in collective negotiations is given by:

$$NP(\gamma) = (\pi(\gamma) - \pi(0))^\mu (U(\gamma) - U(0))^{1-\mu} \quad (5)$$

In the second stage, the trade union sets the wage to maximise its objective U as defined in (1), taking into account that the firm chooses employment afterwards. The determination of the wage, w , subsequent to the choice of the CSR-objective's relevance, γ , is essential for the

⁸We show in Section 4.5.2 that our basic findings hold if $K^{bar}(\gamma)$ is positive and $K^{uni}(\gamma)$ is finite.

findings of the paper, since this sequence makes it feasible that the wage adjusts to the level of γ .⁹ In contrast, the assumption of a wage-setting monopoly trade union can be relaxed without substantially affecting insights, as we demonstrate in Section 4.5.1.

In the third and final stage, the firm chooses employment to maximise $Z(N)$, as defined in (4), given the wage, w , set by the union and the bargained strength, γ^{bar} , of the CSR-objective.

4 Analysis

In this section, we solve the model of Section 3 by backward-induction for the general functional forms outlined above. Moreover, we illustrate our findings for a specific case (see Appendix A.2), featuring a constant output price, a Cobb-Douglas production function, linear employee utility, and a linear CSR-objective. This example helps to resolve some of the ambiguities, which characterise the more general set-up.

4.1 Employment

The first- and second-order conditions for a maximum of (4) are:

$$Z_N = F'(N) - w + \gamma C'(N) = 0 \quad (6)$$

$$Z_{NN} = F''(N) + \gamma C''(N) < 0 \quad (7)$$

While we do not rule out that C is convex in N , we assume that this effect never dominates the strict concavity of the revenue function, $F(N)$, such that the second-order condition is fulfilled. Hence, the (inverse) labour demand curve slopes downward:

$$\frac{\partial N}{\partial w} = N_w(w, \gamma) = \frac{1}{F''(N) + \gamma C''(N)} < 0 \quad (8)$$

The greater the weight of the CSR-objective, the higher is labour demand at a given wage.

$$\frac{\partial N}{\partial \gamma} = N_\gamma(w, \gamma) = -\frac{C'(N)}{F''(N) + \gamma C''(N)} = -N_w(w, \gamma)C'(N) > 0 \quad (9)$$

This impact arises because there is an extra payoff to the firm for expanding employment beyond the profit-maximising level. The effect can also be derived for other CSR-objectives (see, for example, De Fraja 1993, Fanti & Buccella 2019; 2020, and Goerke 2021) and is, therefore, largely independent of their exact specification.

⁹Fanti & Buccella (2021) argue that the CSR-objective may be adjusted more frequently than wages are negotiated, such that wages are chosen prior to the strength of CSR. In our setting, such a sequence of decisions implies that the trade union has no incentive to help the firm to commit to its choice of γ . If, therefore, the sequence of decisions were endogenised, the trade union and the firm would either choose the order we subsequently assume as exogenously given or refrain from negotiating about γ .

For later use, it is helpful to note that the change in the slope of the labour demand curve due to a higher wage is given by $N_{ww} = (dN_w/dN)N_w$ and that we can express the impact of a rise in γ as:

$$N_{w\gamma} = \frac{dN_w}{dN} N_\gamma - \frac{C''(N)}{(F''(N) + \gamma C''(N))^2} = -N_{ww} C'(N) - C''(N)(N_w)^2 \quad (10)$$

Furthermore, we define η as the elasticity of the slope of the labour demand curve with respect to employment, N .

$$\eta = \frac{dN_w}{dN} \frac{N}{N_w} = \frac{N_{ww} N}{(N_w)^2} = -N \frac{F'''(N) + \gamma C'''(N)}{F''(N) + \gamma C''(N)}, \quad (11)$$

4.2 Wages

The union's optimal wage is determined by the maximisation of union utility defined in (1), subject to the labour demand curve implied by equation (6):

$$\frac{dU}{dw} = N_w(w, \gamma)[u(w) - u(\bar{w})] + N(w, \gamma)u'(w) = 0 \quad (12)$$

We assume that the second-order condition, $U_{ww} < 0$, holds, which will surely be the case if the inverse labour demand schedule is not too convex. Therefore, the wage effect of a greater importance of the CSR-objective is determined by the sign of $U_{w\gamma}$.

$$U_{w\gamma} = N_{w\gamma}(u(w) - u(\bar{w})) + N_\gamma u'(w) \quad (13)$$

Substituting the first-order condition (12), as well as (10), into $U_{w\gamma}$, and then using (3) and (9), equation (13) can be rewritten as:

$$\begin{aligned} U_{w\gamma} &= (N_{ww} C'(N) - C''(N)(N_w)^2) \frac{-N u'(w)}{N_w} - N_w u'(w) C'(N) \\ &= N_w u'(w) C'(N) (\eta + \kappa - 1). \end{aligned} \quad (14)$$

The trade union sets a lower wage in the presence of the CSR-objective than in its absence if $\eta + \kappa$ exceed unity. This restriction is fulfilled if the third derivative of the revenue function, $F(N)$, is sufficiently positive and the CSR-objective is linear in employment ($\kappa = 0$). This is, for example, the case for a Cobb-Douglas production function ($F(N) = N^\beta$, $0 < \beta < 1$) and a given output price (see Appendix A.2).

We can summarise the analysis of the trade union's wage setting behaviour in:

Proposition 1.

If the importance of a linear CSR-objective rises, a sufficient condition for the trade union to lower the wage is that the elasticity of slope of the labour demand curve with respect to employment, η , exceeds unity.

Proof: Given $U_{ww} < 0$ and $\kappa = 0$, equation (14) establishes the claim. \square

The constraint on η ensures that more employment raises the slope of the labour demand curve in absolute value. Therefore, a wage increase becomes more costly to the trade union. There is a countervailing effect as employment rises, such that the union's costs of a wage increase decline. A value of $\eta > 1$ ensures the dominance of the first impact. Furthermore, a linear CSR-objective ($\kappa = 0$) guarantees that the firm's gain from expanding employment does not decline because the number of employees rises.

4.3 Changes in Payoffs

In the following, we will consider changes in union utility and profits resulting from the CSR-objective. Such payoff variations come about due to adjustments in wages and employment. A priori, one may hypothesise that both parties can improve their position, relative to a world in which $\gamma = 0$ holds, since they have an additional instrument at their disposal, and it becomes easier to separate the creation of rents from their distribution. However, the comparison of profits and the union's payoff in a setting with wage negotiations, on the one hand, and an efficient bargaining framework, on the other hand, clarifies that a Pareto-improvement need not result (Dowrick, 1990; Petrakis & Vlassis, 2000). To illustrate, observe that the firm has the entire bargaining power with respect to employment in a right-to-manage setting. In an efficient bargaining set-up, it generally has less influence on the employment choice, such that profits may shrink, unless a third instrument becomes available to transfer payoffs. Therefore, there is not only an additional instrument available to determine the size and division of the pie, but the parties' bargaining power changes simultaneously. A qualitatively to some extent comparable mechanism affects the payoff comparisons in the presence and absence of CSR-activities.

The variation in union utility is given by:

$$\frac{dU}{d\gamma} = (N_\gamma + N_w \frac{dw}{d\gamma})[u(w) - u(\bar{w})] + Nu'(w) \frac{dw}{d\gamma} = N_\gamma[u(w) - u(\bar{w})], \quad (15)$$

where the second equality sign results from inserting the first-order condition (12). First, an increase in γ raises labour demand, for a given wage. This impact increases union utility. Second, the wage adjusts. Because the trade union sets the wage, this wage change has no first-order impact. Hence, only the positive employment effect remains and the monopoly trade union unambiguously benefits from an increase in γ .¹⁰ This yields:

Proposition 2.

A greater importance of the CSR-objective raises the utility of a wage-setting trade union.

¹⁰If there is wage bargaining and the wage declines with γ , union utility falls with a wage reduction. We analyse this case in Section 4.5.

Proof: See equations (9) and (15). □

The variation in profits is:

$$\frac{d\pi}{d\gamma} = \frac{\partial\pi}{\partial N} \underbrace{\left(N_{\gamma} + N_w \frac{dw}{d\gamma}\right)}_{=\frac{dN}{d\gamma}} + \frac{\partial\pi}{\partial w} \frac{dw}{d\gamma} + \underbrace{\frac{\partial\pi}{\partial\gamma}}_{=0} = -\gamma C'(N) \frac{dN}{d\gamma} - N \frac{dw}{d\gamma}, \quad (16)$$

where the second equality sign results from equation (6). The solution to $d\pi/d\gamma = 0$ defines the value γ^{max} , which would maximise profits if the firm could commit to an employment choice according to (6) at zero costs ($K^{uni}(\gamma) = 0$). There are two effects of a variation in γ on profits. First, employment changes. The direct impact of a rise in γ on employment is positive. Since the firm employs more workers than profit-maximisation requires, this direct effect reduces profits further. Employment additionally rises with γ if the wage falls, i.e. if $\frac{dw}{d\gamma} < 0$ holds. In this case, the employment-induced change in profits is clearly negative. Second, a lower wage will raise profits, for a given level of employment. If the weight of the CSR-objective is minimal, that is, if $\gamma \rightarrow 0$, the employment change is negligible and profits unambiguously rise with the (introduction of) the CSR-objective if wages decline. Therefore, a negative effect of the CSR-objective on wages ensures that the profit-maximising strength of this objective, γ^{max} , would be positive if the firm could commit to an employment choice in accordance with γ^{max} at zero costs. We summarise the effect of a CSR-objective on profits in:

Proposition 3.

If a profit-maximising firm can credibly commit to an employment-enhancing CSR-objective at zero costs and an according employment choice reduces wages, profits rise with the introduction of such objective.

Proof: See equation (16). □

For the specific example, based on the assumptions of a given output price, a Cobb-Douglas production function $F(N) = N^{\beta}$, $0 < \beta < 1$, a linear CSR-objective, $\kappa = 0$, and a linear utility function, $u' = 1$, we obtain $0 < \gamma^{max} = \bar{w} \frac{(1-\beta)^2}{(1-\beta)^2 + \beta} < \bar{w}$ (see Appendix A.2 for the derivation). Therefore, the fall in the wage is sufficiently pronounced to outweigh the profit-reducing expansion in employment, for values of γ less than γ^{max} .

4.4 Bargaining about the CSR-objective

The bargained level of the relevance of the CSR-objective, γ^{bar} , results from the maximisation of the Nash-product defined in (5).

$$\frac{\partial NP(\gamma)}{\partial\gamma} = \mu(U(\gamma) - U(0)) \frac{d\pi}{d\gamma} + (1 - \mu) \frac{dU}{d\gamma} (\pi(\gamma) - \pi(0)) = 0 \quad (17)$$

Since $dU/d\gamma > 0$ and, hence, $U(\gamma) > U(0)$, γ^{bar} is positive if wages decline with the relevance of the CSR-objectives. A negative wage effect implies that $\pi(\gamma) > \pi(0)$ holds true at least for values of γ^{bar} that are not too high. Therefore, the derivative in (17) is surely positive for $\gamma = 0$, and collectively establishing a CSR-objective can result in a Pareto-improvement. This insights gives rise to:

Proposition 4.

If an employment-enhancing CSR-objective induces the trade union to lower the wage, the bargained level of the relevance of this objective is positive, $\gamma^{bar} > 0$.

Proof: See equations (9), and (15) to (17). □

Effectively, negotiations about the CSR-objective introduce an element of efficient bargaining in the spirit of Edgeworth (1881), Leontief (1946), and Fellner (1947), and as analysed by McDonald & Solow (1981) in a setting comparable to the one considered here. The firm commits to a higher than profit-maximising employment level, for a given wage. In exchange, the trade union will optimally choose a lower wage if the elasticity condition, $\eta + \kappa > 1$, holds. In an efficient bargaining setting, the power locus, that is, the combination of bargained wages and employment levels, is downward-sloping in the employment-wage space. This ensures that both parties benefit from a deviation from an outcome on the labour demand curve (McDonald & Solow, 1981; Creedy & McDonald, 1991). In the present model, such a negative relationship between wages and employment will result if a higher value of γ induces the trade union to lower the wage.

Our finding that a Pareto-improvement can result if firms offer higher employment - via collectively bargained CSR - in exchange for a lower wage is also reminiscent of the implicit contract approach, going back to Azariadis (1975), Baily (1974), and Gordon (1974). The basic idea is that a risk-neutral firm ensures risk-averse workers against employment and wage fluctuations and is compensated by a wage reduction. In contrast to the implicit contract theory, our finding does not relate to fluctuations or shocks and also obtains if workers are risk-neutral. Moreover, in our setting a firm's employment promise is not credible per se, but the power of trade unions to stop production, which individuals workers do not have, is essential for committing a firm to the required employment choice, and for a Pareto-improving outcome.

Inspection of (17), furthermore, demonstrates that the bargained magnitude of the importance of the CSR-objective exceeds the level preferred by the firm if it could commit unilaterally ($\gamma^{bar} > \gamma^{max}$), as long as the union has some say in its determination ($\mu < 1$). This is the case because trade union utility increases in γ at $\gamma = \gamma^{max}$. Consequently, a marginal rise of the importance of γ above γ^{max} has no first-order effect on profits but a positive one on union utility. Collective bargaining about a CSR-objective can, thus, be argued to increase the

intensity of such employment-enhancing behaviour. Consequently, this insight is compatible with the empirical evidence of a positive correlation between the strength of trade unions and CSR (see, for example, Ioannou & Serafeim 2012; Boodoo 2020 and Chantziaras *et al.* 2021).

We can also compare the bargained relevance of the CSR-objective with the level, γ^{opt} , preferred by a social planner. If welfare consists of the sum of profits and union utility, γ^{opt} is defined by $\frac{dU}{d\gamma} + \frac{d\pi}{d\gamma} = 0$ (see Appendix A.1). Evaluating the bargaining solution in (17) at γ^{opt} yields:

$$\frac{\partial NP(\gamma)}{\partial \gamma|_{\gamma=\gamma^{opt}}} = \frac{dU}{d\gamma} \underbrace{[(1 - \mu)(\pi(\gamma^{opt}) - \pi(0)) - \mu(U(\gamma^{opt}) - U(0))]}_{>0} \quad (18)$$

The difference in the union's utility levels is positive, whereas the divergence in profits may be positive or negative. Therefore, the derivative is ambiguous. This ambiguity arises because the social planner weighs the payoffs of the firm and trade union equally ($\mu = 0.5$), whereas this will generally not be the case in a bargaining set-up. Moreover, the payoffs resulting in the case of no agreement affect the bargained outcome, while they have no impact on the social planner's choice.

The ambiguity concerning the difference between γ^{opt} and γ^{bar} is also present in the specific case, based on linear objectives and a Cobb-Douglas production technology (see Appendix A.2). However, the specific case clarifies that private negotiations about the relevance of CSR can result in a level, γ^{bar} , which exceeds the social planner's preferred extent, γ^{opt} . Such an outcome is more likely to arise, the higher the trade union's bargaining power, $1 - \mu$, in the negotiations about the relevance of the CSR-objective and the more concave the production function is. The first requirement ensures that the trade union's gain from more employment, relative to the firm's loss, obtains a greater weight than the social planner attaches to it. As $\pi(\gamma^{opt}) > \pi(0)$, a higher value of $1 - \mu$ makes a positive derivative in (18) more likely. The second condition implies that the loss in profits due to an employment expansion is relatively large because output does not rise by much, relative to labour costs. Thus, the employment increase due to the fall in wages is relatively small. This, in turn, implies that union utility does not rise by as much as if the production function were less concave. Hence, the second summand in (18) is smaller and the derivative is more likely to be positive.

Because employment rises in the strength of the CSR objective, the outcome concerning the relationship between γ^{bar} and γ^{opt} is tantamount to excessive employment. This finding is reminiscent of the overemployment prediction resulting for collective negotiations about wages and employment in partial equilibrium settings (Oswald, 1985). However, in the present framework such an outcome is not due to the feature that alternative employment opportunities are ignored by the trade union and the firm. Instead, there may be overemployment because the desired wage adjustment can only be obtained if the employment choice is

distorted. This impossibility to separate the division of rents from their creation is likely to give rise to inefficient levels of CSR.

While our model does not yield an unambiguous prediction as to whether privately negotiated levels of CSR will be insufficient or excessive, it casts some doubts on the view that exogenously imposed minimum levels of CSR have positive welfare effects. If a CSR-objective is a means to overcome inefficiencies, such as the impossibility to commit to a particular employment choice, CSR prerequisites may prevent efficiency gains relating to other aspects of the relationship between a firm and its workforce.

4.5 Extensions

The analytical framework spelt out in Section 3 relies on two simplifying assumptions, which we consider in more detail now. First, the trade union sets the wage. Second, the difference between the costs of committing to an employment decision in accordance with the CSR-objective in a collective bargain and the costs of doing so unilaterally are maximal. This section clarifies that these simplifications do not qualitatively affect our findings.

4.5.1 Wage Bargaining

If the trade union sets the wage, the strength of the CSR-objective does not alter union utility via the wage adjustment. If there is wage bargaining, though, the union's payoff rises with the wage. Given a negative impact of the CSR-objective on the wage, therefore, the positive effect of CSR on union utility arising in the monopoly union setting may no longer occur. Furthermore, if there is wage bargaining, the negotiated level depends on the firm's objective. Because the firm aims to maximise profits, it is plausible to assume that it also pursues this aim in wage negotiations, while the CSR-objective only pertains to the employment choice.

To analyse the sensitivity of our findings with regard to the assumption of a monopoly trade union, we assume that the firm's payoff in case of no agreement in the Nash-bargain about the wage is zero because no production takes place. Thus, the firm's gain from bargaining equals profits, $\pi = F(N) - wN$. The trade union's gain is given by $N[u(w) - u(\bar{w})]$ because all union members obtain the income \bar{w} if no wage agreement comes about. Denoting the firm's bargaining power in the wage negotiations by α , $0 \leq \alpha \leq 1$, and the trade union's by $1 - \alpha$, the bargained wage is defined by:

$$\frac{\partial NP(w)}{\partial w} = (1 - \alpha)\pi \frac{dU}{dw} - \alpha N[u(w) - u(\bar{w})] \underbrace{(N + \gamma C'(N)N_w)}_{=-\frac{d\pi}{dw}} = 0, \quad (19)$$

where $-\frac{d\pi}{dw} = -(\frac{\partial \pi}{\partial w} + \frac{\partial \pi}{\partial N}N_w) = N + \gamma C'(N)N_w > 0$ if (19) has an interior solution.¹¹ If the

¹¹If the firm preferred a higher wage than the level that maximised the trade union's payoff, the firm could always pay its employees this higher wage. Hence, it would not realise a gain from bargaining. Thus, (19) defines an interior solution for $\frac{dU}{dw} > 0$ and $\frac{d\pi}{dw} < 0$.

Nash-product is strictly concave in the wage, the variation in the bargained wage due to a greater strength of the CSR-objective is determined by the derivative of (19) with respect to γ . Taking into account that $\frac{\partial \pi}{\partial \gamma} = 0$, this derivative is:

$$\begin{aligned} \frac{\partial \left(\frac{\partial NP(w)}{\partial w} \right)}{\partial \gamma} &= (1 - \alpha)\pi U_{w\gamma} - (1 - \alpha)\gamma C''(N)N_\gamma \frac{dU}{dw} + \alpha N_\gamma [u(w) - u(\bar{w})] \frac{d\pi}{dw} \\ &\quad + \alpha [u(w) - u(\bar{w})] N \frac{\partial \left(\frac{d\pi}{dw} \right)}{\partial \gamma} \end{aligned} \quad (20)$$

If the firm has the entire bargaining power ($\alpha = 1$), the 'bargained' wage equals \bar{w} and is unaffected by a change in the strength of the CSR-objective. If the trade union's bargaining power is positive ($\alpha < 1$), the second summand in (20) is non-negative and deducted, while the third is negative and added. If the condition holds, which ensures that the wage falls in a monopoly union setting (i.e., $U_{w\gamma} < 0$) also the first summand in (20) is less than zero. Consequently, the wage falls with γ in a wage bargaining set-up if the profit effect of higher wages does not decline too strongly with the CSR-objective in absolute value. This profit effect, $\frac{\partial \frac{d\pi}{dw}}{\partial \gamma} = -N_\gamma - \frac{d(\gamma C'(N)N_w)}{d\gamma}$, becomes more negative because employment rises with γ , such that a given wage increase reduces profits more strongly. However, there is also an ambiguous second component, because higher wages reduce over-employment. If a rise in γ strengthens the negative impact of higher wages on profits, or does not reduce this effect too strongly, the findings derived for the monopoly union setting carry over to the case of wage negotiations.

We argue above that it is plausible to assume that the firm maximises profits in the wage bargain. Alternatively, the firm's commitment to its CSR-objective could relate to the employment choice and the behaviour in wage negotiations. In such a scenario, the bargained wage would continue to be defined by (19), where π is replaced by Z and $\frac{d\pi}{dw}$ by $\frac{dZ}{dw} = N > 0$, because employment maximises Z , such that $Z_N = 0$. Denoting this derivative by $\frac{\partial \widehat{NP}(w)}{\partial w}$, its change owing to a rise in γ is given by:

$$\frac{\partial \left(\frac{\partial \widehat{NP}(w)}{\partial w} \right)}{\partial \gamma} = (1 - \alpha)ZU_{w\gamma} - (1 - \alpha)C(N) \frac{dU}{dw} - 2\alpha N N_\gamma [u(w) - u(\bar{w})] \quad (21)$$

This derivative is unambiguously negative for $U_{w\gamma} \leq 0$ and $\alpha < 1$, such that the same condition, which ensures a negative wage effect in the monopoly union model, guarantees this effect in a setting with wage bargaining between a trade union and a firm that maximises Z .

In the specific case featuring a constant output price, a Cobb-Douglas production function, linear employee utility, and a linear CSR-objective, the wage falls with γ if the firm maximises Z in the wage bargain (see Appendix A.2). For a profit-maximising firm, however, the optimal wage cannot be computed explicitly.

In summary, the monopoly union assumption simplifies the exposition, without qualitatively affecting the main results.

4.5.2 Costs of Commitment

Thus far, the analysis has been based on the assumption that a collectively bargained strength of the CSR-objective commits the firm to an employment choice in excess of the profit-maximising level at zero costs, while a unilateral choice by the firm is prohibitively expensive. In this section, we investigate the consequences of positive commitment costs in a setting with collective bargaining about γ , such that $K^{bar}(\gamma) > 0$ applies, and of finite costs, $K^{uni}(\gamma)$, in case of a unilateral choice. We retain the assumption concerning the relation between these costs ($K^{bar}(\gamma) < K^{uni}(\gamma)$).

Allowing for positive and finite commitment costs gives rise to two additional effects. First, the bargained and the firm's preferred levels of γ may change. Second, commitment costs can alter the incentives to adhere to the employment level implied by the CSR-objective. In the previous analysis, both aspects were irrelevant because we have either assumed adherence to the promise of an employment choice (of $N(\gamma^{bar}, w)$), or the impossibility to do so (for γ^{max}). Moreover, we de facto presumed that the costs do not vary with the relevance of the CSR-objective.

To incorporate the first aspect, suppose that the fixed costs of commitment in the case of collective bargaining are positive and may rise with γ ($K^{bar}(\gamma > 0) > 0$, $K^{bar'}(\gamma) \geq 0$), while they are finite in the case of a unilateral commitment by the firm and exhibit the same features ($K^{uni}(\gamma > 0) > 0$, $K^{uni'}(\gamma) \geq 0$). The commitment costs are borne by the firm and reduce profits in case of an agreement but not if no consensus about γ can be achieved.

Focussing, first, on a collectively bargained level of the CSR-objective's relevance, we assume that γ^{bar} will be implemented. Otherwise, the trade union would not adjust the wage. Further, we can observe that positive marginal commitment costs reduce the change in profits ($\frac{d\pi}{d\gamma}$) in absolute value.¹² Given the strict concavity of the Nash-product, as defined in (17), a decrease of the firm's gain from bargaining ($\pi(\gamma) - K^{bar}(\gamma) - \pi(0) < \pi(\gamma) - \pi(0)$) and a more pronounced negative impact of a rise in γ on profits ($\frac{d\pi}{d\gamma}$), reduce the bargained magnitude γ^{bar} . Nonetheless, the incentives to establish a positive level of γ persist, as long as the firm's payoff rises, i.e., $\pi(\gamma^{bar}) - K^{bar}(\gamma^{bar}) > \pi(0)$.

We, second, assume that the firm can credibly commit to an employment level $N(\gamma^{max}, w)$ in the absence of collective negotiations about γ . Therefore, the firm's costs of violating the

¹²As profits are given by $F(N) - wN - K^{bar}(\gamma)$ and $Z(N) = F(N) - wN - K^{bar}(\gamma) - \gamma C(N)$, labour demand, the slope of the labour demand curve, and the CSR-effect on labour demand are unaffected by the level of costs, K^{bar} , for $\gamma > 0$. Hence, also the optimal wage and the wage change resulting from a variation in γ remain the same. Therefore, the variation in ($\frac{d\pi}{d\gamma}$) due to the costs of commitment consists of the direct negative impact $K^{bar'}(\gamma)$.

commitment are sufficiently high, such that it complies with the employment promise. If, in contrast, the firm would benefit from deviating from its CSR-based employment commitment, the trade union would anticipate such behaviour and refrain from adjusting the wage.

Given this modification, the firm obtains profits $\pi(\gamma^{max}) - K^{uni}(\gamma^{max})$. If this profit level is less than $\pi(0)$, the analysis of Sections 4.3 and 4.4 is basically unaffected. Otherwise, the firm's gain in the Nash-bargain in (17) is given by $\pi(\gamma^{bar}) - K^{bar}(\gamma^{bar}) - (\pi(\gamma^{max}) - K^{uni}(\gamma^{max}))$. This expression will be positive if the cost difference $K^{uni}(\gamma^{max}) - K^{bar}(\gamma^{bar})$ is sufficiently large. In this case, $\gamma^{bar} > \gamma^{max}$ holds and the previous analysis continues to apply. Because, furthermore, $\pi(\gamma^{max}) - K^{uni}(\gamma^{max}) > \pi(0)$ and $\pi(\gamma^{bar}) - K^{bar}(\gamma^{bar}) < \pi(\gamma^{bar})$, the firm's gain from bargaining over γ will shrink for $K^{bar}(\gamma) > 0$ and $\gamma^{max} > 0$ if the firm can unilaterally commit at costs $K^{uni}(\gamma)$. Therefore, the Nash-bargaining solution will result in a lower bargained level of the strength of the CSR-objective than defined for the cost setting considered in Section 4.4. However, the basic result continues to apply.¹³

The above considerations indicate that a modified specification of commitment costs does not affect our basic insights as long as, first, adherence to an employment choice in accordance with the CSR-objective is cheaper in the case of collective negotiations about the strength of CSR than if the firm chooses γ and, second, the bargained level, γ^{bar} , is positive.

5 Conclusions

In this paper, we consider a profit-maximising firm, which negotiates the wage with a firm-specific, utilitarian trade union and unilaterally selects employment. This firm can establish a CSR-objective that induces it to choose a higher employment level than would maximise profits. However, such a promise is not credible, once the wage has been fixed, because the firm always has an incentive to choose an outcome, which ignores the CSR-objective, in order to maximise profits. Therefore, committing to an employment-enhancing CSR objective is costly. We assume that such commitment costs are lower if the firm and the trade union collectively negotiate the intensity of the CSR-objective, than if the firm unilaterally declares its importance. This difference in commitment costs arises, because the trade union as an insider to the production process can easily establish costly sanctions, such as strikes or dismissal payments if the firm does not adhere to its promise of an excessive employment choice. Given the firm's commitment to employ more individuals than would maximise profits, the bargained wage can fall. Such a wage reduction can provide the firm with a profit-based incentive to negotiate a CSR-objective with the trade union. At the same time, the expansion in

¹³The analysis of the specific case in which we assume a Cobb-Douglas production function and linear specifications in the presence of commitment costs does not yield additional insights. This is because the bargained level, γ^{bar} , of CSR relevance cannot be computed explicitly (see Appendix A.2). This is then also true with respect to profits.

employment can make the trade union better off. Therefore, CSR can mitigate the inefficiency arising from collective wage negotiations.

We show that the basic results outlined above hold as long as the costs of commitment in case of collective bargaining about the CSR-objective are lower than the costs, which arise if the firm unilaterally commits to the CSR-objective. This suggests that such employment-enhancing CSR-objectives are more likely to be established in the context of firm-specific negotiations than if bargaining took place at an industry level. In the latter case, it is more difficult and, hence, more expensive to impose sanctions in case of violating the employment effect captured by the CSR-objective. In consequence, commitment costs are likely to be higher in case of industry-wide negotiations and we can expect to see fewer such agreements in countries, which primarily feature collective bargaining at a more centralised level. Our analysis also suggests that employee-oriented CSR-policies are more likely to arise in countries in which unions are strong and their rights are well established. Such institutional settings can reduce a firm's costs of credibly committing to collective bargained CSR-objectives. While commitment costs are not at the centre of their empirical analyses, the evidence provided by Ioannou & Serafeim (2012), Liang & Renneboog (2017), and Chantziaras *et al.* (2021) is consistent with the above interpretation. Along the same line of argument, one can surmise that employment-enhancing CSR objectives are more likely to exist in firms in which employees have co-determination rights at the plant level. Co-determination provides employees with extra scope for sanctioning deviations in employment from the level implied by the CSR-objective. In Germany, for example, one could expect that such CSR-objectives are more prominent in firms in which a works council is present than in establishments without co-determination.

Using the specific example, based on a given output price, a Cobb-Douglas production function N^β , and a linear CSR-objective and utility function, we can calculate the changes in outcomes for a range of values of the output elasticity (β) and the union's bargaining power ($1 - \mu$) in the determination of the CSR objective. The computations show that the decrease in wages and the increase in profits and union utility are relatively small for an output elasticity, β , in excess of two-thirds, and not sensitive to the bargaining power, μ .¹⁴ The smaller the output elasticity is, the greater becomes the fall in wages and the rise in employment and payoffs. If the output elasticity is below 0.5, the variations in wages, profits, and union utility, relative to a set-up without CSR-objective ($\gamma = 0$), start to exceed ten percent. Therefore, these calculations emphasise that commitment costs must not be too high for the Pareto-gain to be realised. Moreover, the encompassing increase in payoffs is most likely to occur in settings in which firms can easily commit to a CSR-objective in collective negotiations.

The main mechanism, which brings about the possibility of a Pareto-improvement, is the feature of the CSR-objective that it commits the firm to employ more people at a given wage. This implies that other CSR-objectives, which, for example, focus on adverse environmental

¹⁴Details of the calculations are omitted here and available from the authors.

consequences of production and, therefore, generate an extra-payment to the firm for a reduction of output, are likely to induce a higher bargained wage. In consequence, profits decline for two reasons: The firm produces less than the profit-maximising level of output and it pays higher wages. While such environmentally-oriented CSR-objectives may raise welfare, the incentives for firms to adopt them may be less pronounced in the context of collective wage negotiations than if labour markets are competitive. Accordingly, the prediction of a Pareto-improvement resulting from a collective bargain about a CSR-objective is sensitive to the specification of CSR. This suggests that the interaction between collective bargaining and CSR deserves further attention.

A Appendix

A.1 Social Planner's Choice

Suppose, a social planner can determine the strength, γ^{opt} , of the CSR-objective that maximises the sum of profits and union utility. Wages continue to be set by the trade union, while the firm determines employment, $N = N(w, \gamma^{opt})$. The first-order condition for a maximum is:

$$\begin{aligned} \frac{dW}{d\gamma} &= \frac{d\pi}{d\gamma} + \frac{dU}{d\gamma} = 0 \\ \iff -\gamma C'(N)(N_\gamma + N_w \frac{dw}{d\gamma}) - N \frac{dw}{d\gamma} + (N_\gamma + N_w \frac{dw}{d\gamma})[u(w) - u(\bar{w})] + Nu'(w) \frac{dw}{d\gamma} &= 0 \\ \iff \frac{dN}{d\gamma} [u(w) - u(\bar{w}) - \gamma C'(N)] + N(u'(w) - 1) \frac{dw}{d\gamma} &= 0 \end{aligned} \quad (22)$$

We assume that the second-order condition is fulfilled. Because a monopoly union's utility unambiguously rises with the relevance of the CSR-objective for $N_\gamma > 0$ ($dU/d\gamma > 0$), independently of the direction of the wage change, the social planner prefers a higher relevance of the CSR-objective than the firm would choose ($\gamma^{opt} > \gamma^{max}$), could the firm credibly commit to an according employment choice $N(\gamma^{max})$ at zero costs, and defined by $d\pi/d\gamma = 0$.

A.2 Cobb-Douglas Specification, Linear CSR-objective and Linear Utility

Let the price at which the firm sells its output be unity, such that revenues equal output. The production function is given by $F(N) = N^\beta$, $0 < \beta < 1$. The respective derivatives are $F'(N) = \beta N^{\beta-1} > 0$, $F''(N) = \beta(\beta - 1)N^{\beta-2} < 0$, and $F'''(N) = \beta(\beta - 1)(\beta - 2)N^{\beta-3} > 0$. If the CSR-objective is linear, $\kappa = 0$ holds.

The firm's employment choice results from the maximisation of $Z = N^\beta - wN + \gamma N$, which yields:

$$N(w, \gamma) = \left(\frac{w - \gamma}{\beta} \right)^{\frac{1}{\beta-1}}. \quad (23)$$

Initially, we focus on the monopoly union setting and consider Nash-bargaining about the wage at the end of the appendix.

Monopoly Union

In a framework with a wage-setting trade union, the Cobb-Douglas-specification ensures that the wage falls since $\eta + \kappa = \frac{dN_w}{dN} \frac{N}{N_w} + 0 = -N \frac{F'''(N)}{F''(N)} = 2 - \beta > 1$.

In order to explicitly calculate the wage, we additionally assume a linear utility function, $u' = 1$. The union sets the wage to ensure:

$$\frac{dU}{dw} = \frac{\partial N}{\partial w}[w - \bar{w}] + N = N \left(1 - \frac{w - \bar{w}}{(w - \gamma)(1 - \beta)} \right) = 0 \quad (24)$$

From this, we obtain the wage:

$$w(\gamma) = \frac{\bar{w} - \gamma(1 - \beta)}{\beta} \quad (25)$$

A wage, w , in excess of the fallback wage, \bar{w} , requires $\bar{w} > \gamma$. We subsequently assume this restriction to hold. Moreover, the wage falls with a greater relevance of the CSR-objective. Using equations (23) and (25), the optimal level of employment is:

$$N(w(\gamma), \gamma) = \left(\frac{\bar{w} - \gamma}{\beta^2} \right)^{\frac{1}{\beta-1}} \quad (26)$$

It follows that

$$\begin{aligned} \pi(\gamma) &= N(w(\gamma), \gamma)^\beta - w(\gamma)N(w(\gamma), \gamma) \\ &= \left(\frac{\bar{w} - \gamma}{\beta^2} \right)^{\frac{\beta}{\beta-1}} - \frac{\bar{w} - \gamma(1 - \beta)}{\beta} \left(\frac{\bar{w} - \gamma}{\beta^2} \right)^{\frac{1}{\beta-1}} \\ &= \left(\frac{\bar{w} - \gamma}{\beta^2} \right)^{\frac{\beta}{\beta-1}} \left(1 - \beta \frac{\bar{w} - \gamma(1 - \beta)}{\bar{w} - \gamma} \right) \end{aligned} \quad (27)$$

Because $\pi(0) > 0$ holds true, the profit-maximising weight assigned to the CSR-objective in case of zero commitment costs results from:

$$\begin{aligned} \frac{d\pi}{d\gamma} &= \frac{\partial \pi}{\partial N} \left(N_\gamma + N_w \frac{dw}{d\gamma} \right) + \frac{\partial \pi}{\partial w} \frac{dw}{d\gamma} + \underbrace{\frac{\partial \pi}{\partial \gamma}}_{=0} = 0 \\ \iff \frac{\left(\frac{\bar{w} - \gamma}{\beta^2} \right)^{\frac{1}{\beta-1}}}{\beta(1 - \beta)} \left[(1 - \beta)^2 - \gamma \frac{\beta}{\bar{w} - \gamma} \right] &= 0 \iff \gamma^{max} = \bar{w} \frac{(1 - \beta)^2}{(1 - \beta)^2 + \beta} \end{aligned} \quad (28)$$

It is straightforward to show that $\frac{d\pi}{d\gamma} > 0$ for $\gamma < \gamma^{max}$, while $\frac{d\pi}{d\gamma} < 0$ for $\gamma > \gamma^{max}$, such that $\gamma = \gamma^{max}$ indeed maximises profits.

Using equations (25) and (26), trade union utility can be expressed as:

$$U(\gamma) = N(w(\gamma), \gamma)[w - \bar{w}] + M\bar{w} = \left(\frac{\bar{w} - \gamma}{\beta^2} \right)^{\frac{1}{\beta-1}} (1 - \beta) \frac{\bar{w} - \gamma}{\beta} + M\bar{w} \quad (29)$$

It follows that

$$\frac{dU}{d\gamma} = \left(\frac{\bar{w} - \gamma}{\beta^2} \right)^{\frac{1}{\beta-1}} > 0 \quad (30)$$

Using (28) and (30), we can calculate the social planner's choice of γ , which is defined by:

$$\begin{aligned}
\frac{dW}{d\gamma} &= \frac{d\pi}{d\gamma} + \frac{dU}{d\gamma} = 0 \\
&\iff \frac{\left(\frac{\bar{w}-\gamma}{\beta^2}\right)^{\frac{1}{\beta-1}}}{\beta(1-\beta)} [(1-\beta)^2 - \gamma \frac{\beta}{\bar{w}-\gamma}] + \left(\frac{\bar{w}-\gamma}{\beta^2}\right)^{\frac{1}{\beta-1}} = 0 \\
&\iff \gamma^{opt} = \bar{w}(1-\beta) > \gamma^{max}
\end{aligned} \tag{31}$$

If the firm and the trade union bargain about the level of γ , the outcome is defined by the derivative of the Nash-product with respect to γ :

$$\begin{aligned}
\frac{\partial NNP(\gamma)}{\partial \gamma} &= \mu((\bar{w}-\gamma)^{\frac{\beta}{\beta-1}} - \bar{w}^{\frac{\beta}{\beta-1}}) \frac{1}{\beta^{\frac{2\beta}{\beta-1}}} \left(\frac{\bar{w}-\gamma}{\beta^2}\right)^{\frac{1}{\beta-1}} ((1-\beta)^2 - \gamma \frac{\beta}{\bar{w}-\gamma}) \\
&+ (1-\mu) \frac{1}{\beta^{\frac{2\beta}{\beta-1}}} \left(\frac{\bar{w}-\gamma}{\beta^2}\right)^{\frac{1}{\beta-1}} ((\bar{w}-\gamma)^{\frac{\beta}{\beta-1}} (1 - \beta \frac{\bar{w}-\gamma(1-\beta)}{\bar{w}-\gamma}) - \bar{w}^{\frac{\beta}{\beta-1}} (1-\beta)) = 0
\end{aligned} \tag{32}$$

To evaluate this derivative at $\gamma = \gamma^{opt}$, we substitute $\gamma = \gamma^{opt} = \bar{w}(1-\beta)$ into equation (32). Furthermore, to keep the analysis tractable, we set $\bar{w} = 1$, such that

$$\begin{aligned}
\frac{\partial NNP(\gamma)}{\partial \gamma|_{\gamma=\gamma^{opt}, \bar{w}=1}} &= \mu(\beta^{\frac{\beta}{\beta-1}} - 1) \frac{1}{\beta^{\frac{2\beta}{\beta-1}}} \left(\frac{1}{\beta}\right)^{\frac{1}{\beta-1}} ((1-\beta)^2 - (1-\beta)) \\
&+ (1-\mu) \frac{1}{\beta^{\frac{2\beta}{\beta-1}}} \left(\frac{1}{\beta}\right)^{\frac{1}{\beta-1}} (\beta^{\frac{\beta}{\beta-1}} (1 - (1 - (1-\beta)^2)) - (1-\beta)) \\
&= (\beta-1) \frac{1}{\beta^{\frac{2\beta+1}{\beta-1}}} \left[\underbrace{\mu(\beta^{\frac{\beta}{\beta-1}} - 1)\beta}_{(1)} - \underbrace{(1-\mu)[\beta^{\frac{\beta}{\beta-1}}(1-\beta) - 1]}_{(2)} \right]
\end{aligned} \tag{33}$$

The first term in square brackets in the last line of (33) is unambiguously positive (since $\beta < 1$). The second term is deducted and is positive for $\beta < \frac{1}{2}$. Hence, the smaller are μ and β , the more likely it is that the entire expression in (33) is positive. Indeed, we can show that for $\mu < \frac{1}{2}$ and $\beta < \frac{7}{25}$ for example, expression (33) is positive. Negotiations about the importance of CSR can thus result in a level, γ^{bar} , which exceeds the social planner's choice, γ^{opt} .

Wage Bargaining

If the trade union does not set the wage unilaterally, and the firm aims to maximise profits in the wage bargain, the negotiated wage, $w^{b,\pi}$, results from the maximisation of $(N^\beta - wN)^\alpha (N[u(w) - u(\bar{w})])^{1-\alpha}$, and is implicitly defined by:

$$\alpha ((w^{b,\pi} - \gamma)(1-\beta) - \gamma) = (1-\alpha) \frac{w^{b,\pi}(1-\beta) - \gamma}{\beta} \left(\frac{(w^{b,\pi} - \gamma)(1-\beta)}{w^{b,\pi} - \bar{w}} - 1 \right) \tag{34}$$

If, instead, the firm focuses on Z in the the wage bargain, maximisation of $(N^\beta - wN + \gamma N)^\alpha (N[u(w) - u(\bar{w})])^{1-\alpha}$ yields:

$$w^{b,Z} = \frac{(1 - \alpha + \alpha\beta)\bar{w} - (1 - \alpha)(1 - \beta)\gamma}{\beta} \quad (35)$$

The impact of a rise in γ on $w^{b,\pi}$ is subject to the same ambiguities as derived for the more general setting in the main text, irrespective of the trade union's bargaining strength, $1 - \alpha$. Therefore, the analysis of the specific case does not yield additional insights. However, inspection of (35) clarifies that the wage $w^{b,Z}$ unambiguously declines with γ .

References

- Anderson, Simon, & Devereux, Michael. 1989. Profit-sharing and optimal labour contracts. *Canadian Journal of Economics*, **22**(2), 425–433.
- Appelbaum, Elie. 2011. Union–firm bargaining: Order of play and efficiency. *Games and Economic Behavior*, **71**(2), 235–245.
- Atkinson, Anthony B. 1977. Profit-sharing, collective bargaining and employment risk. *Zeitschrift für die gesamte Staatswissenschaft*, **133**(Special Issue), 43–52.
- Azariadis, Costas. 1975. Implicit contracts and underemployment equilibria. *Journal of Political Economy*, **83**(6), 1183–1202.
- Baily, Martin Neil. 1974. Wages and employment under uncertain demand. *The Review of Economic Studies*, **41**(1), 37–50.
- Bhattacharya, Chitra B, Sen, Sankar, & Korschun, Daniel. 2008. Using Corporate Social Responsibility to win the war for talent. *MIT Sloan Management Review*, **49**(2), 37–44.
- Bolvig, Iben. 2005. Firm-provided social concerns? Just another compensating wage differentials story? *International Journal of Manpower*, **26**(7-8), 673–704.
- Boodoo, Muhammad Umar. 2020. The influence of unions on CSR: Is there a trade-off between employee-oriented and non–employee-oriented policies? *British Journal of Industrial Relations*, **58**(4), 816–843.
- Booth, Alison L. 1995. Layoffs with payoffs: A bargaining model of union wage and severance pay determination. *Economica*, **62** (No.248), 551–564.
- Booth, Alison L, & Chatterji, Monojit. 1998. Unions and efficient training. *The Economic Journal*, **108**(447), 328–343.
- Brand, Björn, & Grothe, Michael. 2015. Social responsibility in a bilateral monopoly. *Journal of Economics*, **115**(3), 275–289.
- Brekke, Kjell Arne, & Nyborg, Karine. 2008. Attracting responsible employees: Green production as labor market screening. *Resource and Energy Economics*, **30**(4), 509–526.
- Burbano, Vanessa C. 2016. Social responsibility messages and worker wage requirements: Field experimental evidence from online labor marketplaces. *Organization Science*, **27**(4), 1010–1028.
- Carnahan, Seth, Kryscynski, David, & Olson, Daniel. 2017. When does Corporate Social Responsibility reduce employee turnover? Evidence from attorneys before and after 9/11. *Academy of Management Journal*, **60**(5), 1932–1962.

- Chantziaras, Antonios, Dedoulis, Emmanouil, Grougiou, Vassiliki, & Leventis, Stergios. 2021. The impact of labor unionization on CSR reporting. *Sustainability Accounting, Management and Policy Journal*, **12**(2), 437–466.
- Chen, Steven Xianglong, Lee, Edward, & Stathopoulos, Konstantinos. 2021. Does Corporate Social Responsibility spending affect strike risk? Evidence from union elections. *manuscript*.
- Creedy, John, & McDonald, Ian M. 1991. Models of trade union behaviour: A synthesis. *Economic Record*, **67**(4), 346–359.
- De Fraja, Giovanni. 1993. Unions and wages in public and private firms: A game-theoretic analysis. *Oxford Economic Papers*, **45**(3), 457–469.
- Deutscher Gewerkschaftsbund. 2009. *10-point paper on Corporate Social Responsibility (CSR) adopted by the German Confederation of Trade Unions (DGB) and its affiliates*. Deutscher Gewerkschaftsbund.
- Dowrick, Steve. 1990. The relative profitability of Nash Bargaining on the labour demand curve or the contract curve. *Economics Letters*, **33**(2), 121–125.
- Dustmann, Christian, & Schönberg, Uta. 2009. Training and union wages. *The Review of Economics and Statistics*, **91**(2), 363–376.
- Edgeworth, Francis Ysidro. 1881. *Mathematical psychics: An essay on the application of mathematics to the moral sciences*. CK Paul.
- Eguchi, Kyota. 2002. Unions as commitment devices. *Journal of Economic Behavior & Organization*, **47**(4), 407–421.
- Ertugrul, Mine, & Marciukaityte, Dalia. 2021. Labor unions and Corporate Social Responsibility. *Journal of Banking & Finance*, **125**, 106061.
- Fanti, Luciano, & Buccella, Domenico. 2017a. Bargaining agenda in a unionised monopoly with network effects: when corporate social responsibility may be welfare-reducing. *Economia Politica*, **34**(3), 471–489.
- Fanti, Luciano, & Buccella, Domenico. 2017b. Corporate Social Responsibility, profits and welfare with managerial firms. *International Review of Economics*, **64**(4), 341–356.
- Fanti, Luciano, & Buccella, Domenico. 2018. Profitability of corporate social responsibility in network industries. *International Review of Economics*, **65**(3), 271–289.
- Fanti, Luciano, & Buccella, Domenico. 2019. Corporate Social Responsibility in a unionised duopoly. *Estudios de Economía*, **46**(2), 227–244.

- Fanti, Luciano, & Buccella, Domenico. 2020. Pareto-superiority of Corporate Social Responsibility in unionised industries. *Arthaniti: Journal of Economic Theory and Practice*, **19**(2), 131–150.
- Fanti, Luciano, & Buccella, Domenico. 2021. Corporate Social Responsibility in unionised network industries. *International Review of Economics*, **68**(2), 235–262.
- Fellner, William. 1947. Prices and wages under bilateral monopoly. *The Quarterly Journal of Economics*, **61**(4), 503–532.
- Flammer, Caroline, & Luo, Jiao. 2017. Corporate Social Responsibility as an employee governance tool: Evidence from a quasi-experiment. *Strategic Management Journal*, **38**(2), 163–183.
- Goering, Gregory E. 2008. Socially concerned firms and the provision of durable goods. *Economic Modelling*, **25**(3), 575–583.
- Goering, Gregory E. 2014. The profit-maximizing case for Corporate Social Responsibility in a bilateral monopoly. *Managerial and Decision Economics*, **35**(7), 493–499.
- Goerke, Laszlo. 2021. Trade unions and Corporate Social Responsibility. *Annals of Public and Cooperative Economics*, **forthcoming**.
- Gordon, Donald F. 1974. A neo-classical theory of Keynesian unemployment. *Economic Inquiry*, **12**(4), 431.
- Greening, Daniel W, & Turban, Daniel B. 2000. Corporate social performance as a competitive advantage in attracting a quality workforce. *Business & Society*, **39**(3), 254–280.
- Hedblom, Daniel, Hickman, Brent R, & List, John A. 2019. *Toward an understanding of corporate social responsibility: Theory and field experimental evidence*. Working Paper No. 26222. National Bureau of Economic Research.
- Heinkel, Robert, Kraus, Alan, & Zechner, Josef. 2001. The effect of green investment on corporate behavior. *Journal of Financial and Quantitative Analysis*, **36**(4), 431–449.
- Hogan, Chad. 2001. Enforcement of implicit employment contracts through unionization. *Journal of Labor Economics*, **19**(1), 171–195.
- Ioannou, Ioannis, & Serafeim, George. 2012. What drives corporate social performance? The role of nation-level institutions. *Journal of International Business Studies*, **43**(9), 834–864.
- Iyer, Ganesh, & Soberman, David A. 2016. Social responsibility and product innovation. *Marketing Science*, **35**(5), 727–742.
- Jackson, Gregory, Doellgast, Virginia, & Baccaro, Lucio. 2018. Corporate Social Responsibility and labour standards: Bridging business management and employment relations perspectives. *British Journal of Industrial Relations*, **56**(1), 3–13.

- Jerger, Jürgen, & Michaelis, Jochen. 1999. Profit sharing, capital formation and the NAIRU. *Scandinavian Journal of Economics*, **101**(2), 257–275.
- Kim, E Han, Maug, Ernst, & Schneider, Christoph. 2018. Labor representation in governance as an insurance mechanism. *Review of Finance*, **22**(4), 1251–1289.
- Kitzmueller, Markus, & Shimshack, Jay. 2012. Economic perspectives on Corporate Social Responsibility. *Journal of Economic Literature*, **50**(1), 51–84.
- Kopel, Michael, & Brand, Björn. 2012. Socially responsible firms and endogenous choice of strategic incentives. *Economic Modelling*, **29**(3), 982–989.
- Koppel, Hannes, & Regner, Tobias. 2014. Corporate Social Responsibility in the work place. *Experimental Economics*, **17**(3), 347–370.
- KPMG. 2017. *The Road Ahead – The KPMG Survey of Corporate Responsibility Reporting 2017*. Tech. rept.
- Lambertini, Luca, & Tampieri, Alessandro. 2015. Incentives, performance and desirability of socially responsible firms in a Cournot oligopoly. *Economic Modelling*, **50**, 40–48.
- Lambertini, Luca, Palestini, Arsen, & Tampieri, Alessandro. 2016. CSR in an asymmetric duopoly with environmental externality. *Southern Economic Journal*, **83**(1), 236–252.
- Lee, Sunghee, & Jung, Heungjun. 2016. The effects of Corporate Social Responsibility on profitability. *Management Decision*, **54**(6), 1383–1406.
- Leontief, Wassily. 1946. The pure theory of the guaranteed annual wage contract. *Journal of Political Economy*, **54**(1), 76–79.
- Liang, Hao, & Renneboog, Luc. 2017. On the foundations of Corporate Social Responsibility. *The Journal of Finance*, **72**(2), 853–910.
- List, John A., & Momeni, Fatemeh. 2021. When Corporate Social Responsibility backfires: Theory and evidence from a natural field experiment. *Management Science*, **67**(1), 8–21.
- Malcomson, James M. 1983. Trade unions and economic efficiency. *The Economic Journal*, **93**(Suppl.), 51–65.
- Manasakis, Constantine, Mitrokostas, Evangelos, & Petrakis, Emmanuel. 2013. Certification of Corporate Social Responsibility activities in oligopolistic markets. *Canadian Journal of Economics/Revue canadienne d'économique*, **46**(1), 282–309.
- Manasakis, Constantine, Mitrokostas, Evangelos, & Petrakis, Emmanuel. 2014. Strategic Corporate Social Responsibility activities and corporate governance in imperfectly competitive markets. *Managerial and Decision Economics*, **35**(7), 460–473.

- McDonald, Ian M, & Solow, Robert M. 1981. Wage bargaining and employment. *The American Economic Review*, **71**(5), 896–908.
- Newman, Carol, Rand, John, Tarp, Finn, & Trifkovic, Neda. 2020. Corporate Social Responsibility in a competitive business environment. *The Journal of Development Studies*, **56**(8), 1455–1472.
- Non, Arjan, Rohde, Ingrid, de Grip, Andries, & Dohmen, Thomas. 2021. *Mission of the company, prosocial attitudes and job preferences: A discrete choice experiment*. Discussion Paper, No. 113. ECONtribute.
- Nyborg, Karine. 2014. Do responsible employers attract responsible employees? *IZA World of Labor*.
- Nyborg, Karine, & Zhang, Tao. 2013. Is Corporate Social Responsibility associated with lower wages? *Environmental and Resource Economics*, **55**(1), 107–117.
- OECD. 2019. *Negotiating our way up - Collective bargaining in a changing world of work*. OECD Publishing.
- Oswald, Andrew J. 1985. The economic theory of trade unions: An introductory survey. *The Scandinavian Journal of Economics*, **87**(2), 160–193.
- Petrakis, Emmanuel, & Vlassis, Minas. 2000. Endogenous scope of bargaining in a union-oligopoly model: When will firms and unions bargain over employment? *Labour Economics*, **7**(3), 261–281.
- Pita, Cristina. 1997. Breach penalties in labour contracts: Advance notice and severance pay. *Labour*, **11**(3), 469–495.
- Planer-Friedrich, Lisa, & Sahm, Marco. 2020. Strategic Corporate Social Responsibility, imperfect competition, and market concentration. *Journal of Economics*, **129**(1), 79–101.
- Pohjola, Matti. 1987. Profit-sharing, collective bargaining and employment. *Journal of Institutional and Theoretical Economics (JITE)/Zeitschrift für die gesamte Staatswissenschaft*, **143**(2), 334–342.
- Preuss, Lutz. 2008. A reluctant stakeholder? On the perception of Corporate Social Responsibility among European trade unions. *Business Ethics: A European Review*, **17**(2), 149–160.
- Preuss, Lutz, Haunschild, Axel, & Matten, Dirk. 2006. Trade unions and CSR: a European research agenda. *Journal of Public Affairs: An International Journal*, **6**(3-4), 256–268.
- Scholz, Robert, & Vitols, Sigurt. 2019. Board-level codetermination: A driving force for Corporate Social Responsibility in German companies? *European Journal of Industrial Relations*, **25**(3), 233–246.

Visser, Jelle. 2019. ICTWSS Database. version 6.0. *Amsterdam: Amsterdam Institute for Advanced Labour Studies (AIAS), University of Amsterdam.*