Collective bargaining about corporate social responsibility

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Abstract. If a profit-maximizing firm credibly commits to an employment-enhancing corporate social responsibility 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 corporate social responsibility objective than in its absence. Accordingly, establishing a corporate social responsibility objective can give rise to a Pareto improvement and mitigate the inefficiency resulting from collective wage negotiations.

Résumé. Négociation collective sur la responsabilité sociale d'entreprise. Si une entreprise voulant maximiser les profits fixe de façon crédible un objectif de responsabilité sociale d'entreprise visant à améliorer l'emploi dans le cadre des négociations avec un syndicat, ce dernier peut réduire ses demandes salariales. Toutes choses étant égales par ailleurs, des salaires inférieurs augmentent les profits alors que la hausse de l'emploi améliore les gains d'un syndicat qui fixe les salaires. Ainsi, à la fois l'entreprise et le syndicat peuvent être avantagés par un objectif de responsabilité sociale d'entreprise négocié collectivement. En conséquence, l'établissement d'un objectif de responsabilité sociale d'entreprise peut donner lieu à un critère de Pareto et peut atténuer l'inefficacité résultant des négociations salariales collectives.

1. Introduction

IN RECENT DECADES, an increasing number of firms started pursuing corporate social responsibility (CSR) objectives, acknowledging the significance of contributing positively to society and the environment. 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. Given the feature that activities in any of these domains are costly, do firms forego profits by behaving in a socially responsible manner? Friedman (2002, p. 133) assumed this

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implicitly when making his famous claim that "there is one and only one social responsibility of business—to use its resources and engage in activities designed to increase its profits...." Or could incorporating CSR activities actually serve as a means to augment profits, such that companies do well by doing good? In the discussion about profit-enhancing or strategic CSR activities, several arguments have been put forward: CSR as a commitment device for firms to a particular output market behaviour, CSR as a strategy to increase the customers' willingness to pay for products or services, or CSR as a means to increase employee productivity, amongst others. The role of trade unions, however, has been widely neglected (Jackson et al., 2018; Abriata and Delautre, 2020). This is surprising because collective bargaining is prevalent for an overwhelming fraction of the workforce in many OECD and European Union member states (OECD and AIAS, 2023). 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, 2022).

In this paper, we set up a model to show how CSR activities in the presence of collective wage bargaining can result in a Pareto improvement. Thus far, analytical approaches of collective bargaining with firms that take into account CSR concerns are relatively scarce and no commonly accepted modelling strategy has emerged. In consequence, we base our investigation on a standard model of firm-specific wage negotiations (cf. Oswald, 1985) in which, initially, the wage is determined. Subsequently, the firm unilaterally chooses employment. Extending this standard set-up, we assume that prior to the determination of wages, the strength of a CSR objective is selected. We argue that collective bargaining about an employment-enhancing CSR objective in the first stage makes a profit-maximizing firm's commitment to such concerns credible. 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 because it may, for example, call a strike or induce employees to reduce effort and work to rule. If the resulting reduction in profits exceeds the direct detrimental impact of adhering to the CSR objective, the firm will stick to its commitment. Given the resulting expansion in employment, which is amplified by the CSR objective, the trade union actually benefits from a reduction of the bargained wage to below the level that would prevail in the absence of CSR activities. Finally, we show that if the CSR objective is not too important for the firm's employment decision, profits may rise because the fall in wages dominates the negative impact of higher employment. In consequence, a collectively negotiated CSR objective not only may enhance profits but also can give rise to a Pareto improvement. This positive welfare effect arises because an employment-enhancing CSR objective induces a move towards an efficient bargaining outcome. CSR activities can thus mitigate the inefficiencies on the input market and facilitate the sharing of the ensuing gains between the firm and its employees.

Trade union representatives often approach companies' CSR activities with scepticism and view these initiatives as potential substitutes 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 form part of a firm's public relations strategy.[1] Our analysis clarifies that such

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[1] See, for example, the statements by the German Trade Union Federation (Deutscher Gewerkschaftsbund, 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).

worries need not be justified if trade unions play a distinct role in the implementation of CSR activities such that firms have an immediate interest in the union's cooperation.

Our theoretical investigation generates the empirically testable prediction that if collective bargaining makes a profit-maximizing firm's CSR commitment credible, negotiations about wages will result in a wage–employment combination that does not lie on the firm's labour demand curve, although the firm determines the level of employment. Thus, it provides an explanation for the empirical evidence, which the survey by Lawson (2011, p. 302) on the efficiency of collective bargaining outcomes summarizes as follows:

> Efficient bargaining may be a reasonable approximation in some cases, whereas in many and perhaps most cases, some other explanation not easily categorized into the two main models we have examined (namely a monopoly union model and efficient bargaining) may be superior.

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. We discuss extensions of the basic framework in section 5. Section 6 summarizes and provides concluding remarks.

2. Related literature

Our analysis is related to four, partly complementary strands of literature. The first considers a firm's incentives to pursue a CSR objective in order to raise profits.[2] The second looks at the impact of CSR on labour as input factor. Thirdly, we can compare our results to those of collective bargaining analyses about wages and a second component, which partially separates the firm's employment choice from per capita labour costs. Finally, there are studies that presume that trade unions help firms to commit to prima facie non-optimal behaviour.

CSR activities often imply that a firm deviates from profit-maximizing behaviour. Nonetheless, pursuing a CSR objective can imply that the direct negative profit impact is compensated by indirect effects via higher revenues or a decline in costs. In consequence, profit-maximizing firms may have a strategic incentive to pursue a CSR objective and do well themselves by doing good things to others. 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 and Grothe, 2015). This commitment may also require the delegation of decisions to managers whose choices are altered by CSR objectives (Kopel and Brand, 2012; Manasakis et al., 2014; Fanti and Buccella, 2017b). Alternatively, CSR may increase the consumers willingness to pay (Lee and Jung, 2016; Fanti and Buccella, 2018; Alipranti et al., 2024), especially in the presence of social comparisons and oligopolistic markets (Iyer and Soberman, 2016), allow firms to take adverse environmental production effects into account (Lambertini and Tampieri, 2015; Lambertini et al., 2016), deter entry by potential competitors (Planer-Friedrich and Sahm, 2020), or reduce the costs of external funding (Heinkel et al., 2001). CSR can also serve as a device to coordinate on the most profitable among multiple equilibria in a market setting with negative externalities among firms (Albuquerque and Cabral, 2023). In this paper, we focus on labour costs and show that CSR may lower bargained wages and, thus, raise profits.

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2 This is not to say that firms often undertake CSR activities that lower profits (see Hong and Shore, 2023).

Analyses of the role of labour in the context of a firm's CSR activities have mostly focused on employees. Those individuals for whom CSR concerns are important self-select into firms with such objectives (Greening and Turban, 2000; Brekke and Nyborg, 2008; Non et al., 2022). They may also change their behaviour in other ways, such that labour costs decline. Most contributions investigating this kind of argument have an empirical orientation. They, inter alia, consider the impact on wages (Bolvig, 2005; Burbano, 2016; Nyborg, 2014; Nyborg and Zhang, 2013; Newman et al., 2020), the compensation structure (D'Mello et al., 2023), application rates (Hedblom et al., 2019), turnover (Carnahan et al., 2017), effort (Brekke and Nyborg, 2008; Koppel and Regner, 2014; Hedblom et al., 2019), knowledge spillovers to competitors (Flammer and Kacperczyk, 2019) and employee misbehaviour (List and Momeni, 2021). 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 the presence of CSR activities have a stronger theoretical focus. Goerke (2022) assumes that CSR objectives are exogenously given and compares wage bargaining and efficient negotiations. Moreover, he derives conditions ensuring that the firm and the trade union benefit from CSR. However, Goerke (2022) does not consider the question why a firm would adopt a CSR objective and how it can credibly commit to non-profit-maximizing behaviour. In the present contribution, collective negotiations about CSR enhance the credibility of such objective and the trade union is co-deciding on the strength of such concerns. In two related studies, Fanti and Buccella (2019, 2020) investigate a Cournot duopoly and, hence, combine two distortions: Imperfectly competitive input and output markets. They show that adopting a CSR objective can commit firms to higher output and, thus, enables them to pay lower wages such that profits may rise. Accordingly, firms can have an incentive to establish a CSR objective unilaterally. Furthermore, the increase in output can ensure that consumers and workers benefit from CSR.[3] In contrast to this paper, the trade union is not involved in the specification of the CSR objective, and the predictions critically depend on the firms' interaction on the duopolistic output market. The investigation closest to ours is the one by Alipranti et al. (2024). The authors set up a duopoly model with differentiated goods in which CSR directly enhances consumers' willingness to pay and union utility, which is linear in wages and employment. Alipranti et al. (2024) show that bargaining about CSR and wages yields higher payoffs for firms and trade unions and also generates an increase in consumer surplus, in comparison to negotiations about wages alone. Therefore, duopolists and the rent-maximizing trade unions have an incentive to incorporate CSR into the bargaining agenda. Similarly to the present contribution, such an inclusion enhances bargaining efficiency. In contrast to our analysis, CSR can have positive payoff consequences without any alteration in the bargained wage, also due to output market repercussions. The wage adjustment, however, is central for the effects we derive below, while it primarily serves as a signalling device in the analysis by Alipranti et al. (2024). While our investigation focuses on an employment- or output-related CSR objective, Alipranti et al. (2024) assume that CSR activities have a direct impact on the consumers' and employees' utility.

A number of recent analyses consider the impact of union strength on CSR activities empirically. For the United Kingdom, Boodoo (2020) reports a positive correlation between union density and employee-oriented CSR objectives and a U-shaped association for CSR

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3 In a further set of papers, the authors analyze 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 and Buccella, 2017a, 2021).

scores that do not focus on the workforce. The evidence for the United States is mixed: While Ertugrul and Marciukaityte (2021) and Kini et al. (2022) observe a negative impact of unionization on CSR, Chantziaras et al. (2021) find the opposite outcome. In Chen et al. (2020) the relationship between unionization and CSR spending depends on industry characteristics and whether the expenditure is employee-related or not. Heitz et al. (2024) document that employee-related CSR is higher in unionized firms, whereas CSR activities concerning external stakeholders are lower, suggesting a substitution effect.[4] Turning to cross-country evidence, Ioannou and Serafeim (2012) and Kinderman and Lutter (2018) show a positive correlation between union density and CSR activities. Abriata and Delautre (2020) establish such a relationship between co-determination and various measures of employee-related CSR indicators.[5] Liang and 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 union's bargaining power, on the one hand, and CSR on the other.

Our analysis is also related to investigations that 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 may become feasible to achieve an efficient bargaining outcome. Various additional income sources for workers have been considered, such as a share of profits (Pohjola, 1987; Anderson and Devereux, 1989; Jerger and Michaelis, 1999),[6] 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 also determined by non-monetary CSR elements. 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 because they impose costs on firms, for example, by calling a strike, if firms do not adhere to their contractual obligations (see also Hogan, 2001; Eguchi, 2002)[7]. Dustmann and Schönberg (2009) consider a 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. Because 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

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4 For a completely different industrial relations system, Khan and Rammal (2022) indicate that trade union and employers cooperate to establish CSR in the Bangladesh ready-made garment industry, though not always to the benefit of employees.

5 Scholz and 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.

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

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

that workers stay and alleviating the incentives to train workers (see also Booth and Chatterji, 1998). In contrast to these investigations, we presume that the trade union establishes ex ante credibility for the firm's ex post employment choice.

3. Model

3.1. Set-up

We consider a multi-stage game in which a firm-specific, utilitarian trade union sets the wage in stage two and the firm subsequently chooses employment in the final stage, stage three. The firm's ultimate objective is to maximize profits. In stage one, the relevance of CSR for the firm's output choice is determined cooperatively between the firm and the trade union. The CSR objective induces the firm to choose a higher level of output for a given wage and, thus, of employment than if it maximized profits in stage three. The trade union can anticipate the resulting increase in its payoff by lowering the wage in stage two, relative to a setting without CSR. Therefore, the firm may have a profit-based incentive in the first stage to distort its employment decision at stage three by agreeing to pursue a CSR objective.

A unilateral commitment by the firm to a CSR objective is not credible, once the wage has been set. The reason is that profits are higher if the firm ignores the CSR objective in its employment choice in stage three than if it adhered to its commitment. Therefore, a firm always has an incentive to renege on any promise relating to a non-profit-maximizing employment level. To account for this credibility issue, we assume that a commitment to a CSR objective is costly.[8]

In particular, the firm can credibly commit to the importance of the CSR objective in its choice of employment in a unilateral manner at costs $K^{uni}(\gamma)$, where $\gamma \geq 0$ denotes the strength of the CSR objective. As an alternative, the trade union and the firm can bargain about the importance of the CSR objective. The resulting costs of commitment are labelled $K^{bar}(\gamma)$. We assume $K^i(0) = 0$, $K^i(\gamma > 0) > 0$ and $\frac{dK^i(\gamma)}{d\gamma} = K^{i'}(\gamma) \geq 0$, where $i = bar, uni$. Moreover, the costs of credibly committing to a bargained agreement are lower than if the firm unilaterally sets γ, implying that $K^{uni}(\gamma) > K^{bar}(\gamma)$ 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-maximizing level is possible at lower costs than if the firm unilaterally determined γ.[9]

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 commitment costs were the same as in the bargaining case ($K^{uni}(\gamma) = K^{bar}(\gamma)$)—in contrast to the assumption we made above and employ otherwise throughout the analysis. This hypothetical outcome helps to evaluate the bargained level, γ^{bar}, of the relevance of the CSR objective.

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

9 There 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, which focuses on collective representation, employee involvement enhances the potential for positive profit effects of CSR.

3.2. Trade union

The trade union maximizes the utility of its M members. All members are ex ante identical, and their utility function, u, is increasing in its argument at a weakly decreasing rate, $u' > 0 \geq u''$. As usual, membership exceeds employment. N employed union members obtain the wage, w, while the remaining $M - N$ members receive an alternative income, denoted by $\overline{w} > 0$. It could, for example, describe the wage paid in a perfectly competitive labour market. Therefore, the union's objective, U, is (Oswald, 1985)

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

3.3. Firm

The firm maximizes 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

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

Per capita revenues, $F(N)/N$, exceed the competitive wage, such that there is a rent to be shared between the firm and the trade union. This rent may arise due to the firm's output market power or superior productivity. We do not specify the source of the firm's profitability because our findings do not depend on the nature of the underlying market imperfection.

Employment deviates from the profit-maximizing level, implied by $\pi_N = 0$, because the firm pursues a CSR objective. This objective can relate to a multitude of aspects (Kitzmueller and 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 and Sahm, 2020). In our context with collective wage determination, the employees play a central role.

We do not restrict our attention to a particular CSR objective and pursue an encompassing approach. Given the specification of union utility, which depends on wages and employment only, the envisaged mechanism to achieve a Pareto improvement requires the CSR objective to increase in employment, N. In particular, it 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., $C(N) = 0.5N^2$).[10]

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10 The CSR objective $C(N)$ is compatible with consumer orientation if the demand schedule is linear, $P = a - N, a > 0$; this is also true for the production function and the firm is the sole producer of the good. If union utility depends on other CSR-related aspects of employee relations, which are costly for the firm to realize, the findings we derive below for $C(N)$ can also be obtained, given that collective bargaining about these aspects makes the firm's commitment credible. Therefore, our analysis is applicable to a broad range of CSR objectives, although we frame it more narrowly to clarify that it already applies for the standard, though restrictive specification (1) of union preferences.

The firm's employment choice in stage three results from the maximization of the weighted sum of profits, π, and the CSR objective, $C(N)$, where the strength, γ, of the CSR objective describes the weight of such concerns. We denote this objective by Z and, once again, do not incorporate commitment costs into the specification

$$Z(N) = \pi(N) + \gamma C(N) = F(N) - wN + \gamma C(N). \tag{3}$$

3.4. Importance of CSR objective and sequence of decisions

In the first stage, the firm and the trade union bargain over the importance of the CSR objective in the firm's employment decision. Often the Nash bargaining solution is invoked to determine the outcome of negotiations between these two parties (Haake et al., 2023). For simplicity, we follow this convention and note in passing that any other cooperative determination of the CSR objective would suffice to obtain our main findings, as long as it credibly establishes the alteration in the firm's objective. Formally, we have integrated the assumption that negotiations about CSR enhance the credibility of acting in accordance with such an objective when determining employment by postulating that the firm's costs of committing to such a profit-maximizing employment choice are lower than if the firm unilaterally decided on γ. Therefore, we normalize 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 ($K^{uni}(\gamma > 0) \to \infty$).[11]

When bargaining with the trade union about the importance of the CSR objective, the firm does so from the perspective of a profit-maximizing entity because profits constitute its ultimate objective (see, inter alia, Goering, 2014; Manasakis et al., 2014; Albuquerque and Cabral, 2023). Hence, 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 is obtained for $\gamma = 0$. This is because the trade union will not adjust the wage if there is no credible commitment to 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 $\pi(0) = \pi(N(w(0), 0), w(0))$. 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 $1 - \mu$ (μ), $0 \leq \mu \leq 1$.

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

$$NP(\gamma) = (\pi(\gamma) - \pi(0))^{\mu} (U(\gamma) - U(0))^{1-\mu}. \tag{4}$$

In the second stage, the trade union sets the wage to maximize its objective U as defined in (1), taking into account that the firm chooses employment afterwards. In the third and final stage, the firm chooses employment to maximize $Z(N)$, as defined in (3), given the wage, w, set by the union and the bargained strength, γ^{bar}, of the CSR objective.

The determination of the wage, w, subsequent to the choice of the CSR objective's relevance, γ, is essential for the findings of the paper because this sequence makes it feasible

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11 We clarify in section 5.2 that our basic findings hold if $K^{bar}(\gamma)$ is positive and $K^{uni}(\gamma)$ is finite.

that the wage adjusts to the level of γ.[12] We argue in section 5.3 that a determination of employment prior to wage setting reduces the scope for Pareto-improving negotiations about CSR concerns but leaves the main insights of the analysis unaffected. Moreover, the assumption of a wage-setting monopoly trade union can also be relaxed, as we demonstrate in section 5.1.

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, featuring a constant output price, a Cobb–Douglas production function, linear employee utility and a linear CSR objective (see appendix A5). The simplifications help to resolve some of the ambiguities characterizing the more general set-up.

4.1. Employment

The first-order condition for a maximum of the firm's objective as specified in equation (3) is

$$Z_N = F'(N) - w + \gamma C'(N) = 0. \tag{5}$$

For $\gamma > 0$, the marginal worker is paid more than marginal revenues. The firm can nonetheless be profitable because it remunerates inframarginal workers below their marginal value product. 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.

Equation (5) implicitly defines the firm's labour demand in the presence of CSR concerns. It clarifies that the CSR objective alters both the employment response to a wage variation and the level of labour demand, for a given wage. Given the second-order condition, the labour demand curve slopes downward:

$$\frac{\partial N}{\partial w} = -\frac{Z_{Nw}}{Z_{NN}} = N_w(w, \gamma) = \frac{1}{F''(N) + \gamma C''(N)} < 0. \tag{6}$$

The greater the weight of the CSR objective, the higher the quantity of labour demanded at a given wage:

$$\frac{\partial N}{\partial \gamma} = N_\gamma(w, \gamma) = -\frac{C'(N)}{F''(N) + \gamma C''(N)} = -N_w(w, \gamma)C'(N) > 0. \tag{7}$$

The shift in the labour demand schedule to the right in the wage–employment space due to an increase in the importance of CSR concerns arises because there is an extra payoff to the firm for expanding employment beyond the profit-maximizing level. The effect can also be derived for other CSR or CSR-like objectives (see, for example, De Fraja 1993; Fanti

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12 Fanti and 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 endogenized, the trade union and the firm would either choose the order we subsequently assume as exogenously given or refrain from negotiating about γ.

and Buccella, 2019, 2020; Goerke 2022) and, therefore, appears to be largely independent of their exact specification.

For later use, it is helpful to note that $N_{ww} = (dN_w/dN)N_w$ and ϵ defines the (absolute) wage elasticity of labour demand:

$$\epsilon = -\frac{dN}{dw}\frac{w}{N} = -\frac{F'(N) + \gamma C'(N)}{N(F''(N) + \gamma C''(N))} > 0. \tag{8}$$

4.2. Wages

The union's optimal wage is determined by the maximization of union utility defined in equation (1), subject to the labour demand curve implied by equation (5):

$$\frac{dU}{dw} = U_w = N_w(w,\gamma)[u(w) - u(\overline{w})] + N(w,\gamma)u'(w) = 0. \tag{9}$$

We assume that the second-order condition, $U_{ww} < 0$, holds, which will surely be the case if the 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 $U_{w\gamma}$:

$$U_{w\gamma} = N_{w\gamma}(u(w) - u(\overline{w})) + N_\gamma u'(w). \tag{10}$$

Substituting the first-order condition (9), as well as the labour demand elasticity (8) and its derivative, into $U_{w\gamma}$, equation (10) can be rewritten as

$$U_{w\gamma} = -\frac{u'(w)}{N_w}[N_{w\gamma}N - N_\gamma N_w] = -\underbrace{\frac{u'(w)N}{\epsilon}}_{(-)}\frac{d\epsilon}{d\gamma}. \tag{11}$$

Therefore, the impact via the slope of the labour demand curve will dominate the level effect, if the wage elasticity of labour demand ϵ rises in absolute value with a greater importance of the CSR objective ($d\epsilon/d\gamma > 0$). In consequence, the trade union sets a lower wage in the presence of the CSR objective than in its absence. The restriction relating to the wage elasticity of labour demand ϵ will, for example, be fulfilled if the CSR objective is linear in employment, $C'(N) = 1$, the output price is given and the production function is Cobb–Douglas ($F(N) = N^\beta$, $0 < \beta < 1$) (see appendix A5).

We can summarize the analysis of the trade union's wage setting behaviour in the following proposition.

PROPOSITION 1. *A greater importance of the CSR objective induces the trade union to lower the wage if the wage elasticity of labour demand increases with the relevance of the CSR objective.*

Proof. Given $U_{ww} < 0$, equation (11) establishes the claim. ∎

A greater importance of the CSR objective has two effects on the trade-off the union faces: First, the increase in labour demand ($N_\gamma > 0$) makes a higher wage more beneficial because more employed individuals benefit from it. Second, the slope of the labour demand curve changes. If it becomes flatter in the wage–employment space and $N_{w\gamma} = -N_{ww}C'(N) - C''(N)(N_w)^2 < 0$ holds, the costs of a wage increase rise. The second effect will dominate and the wage will fall with a greater importance of CSR concerns if the wage elasticity of labour demand rises in absolute value.[13]

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13 See, for example, Holmlund (1989, p. 27). An isoelastic shift of the labour demand curve has no impact on the trade union's optimal wage (McDonald and Solow 1981; Oswald 1985).

4.3. Changes in payoffs

In the following, we will consider changes in the union's utility and the firm's profits that result from a greater importance of the CSR objective. Such payoff variations come about due to adjustments in wages and employment. A priori, one may hypothesize that both parties can improve their position, relative to a world in which $\gamma = 0$ holds, because they have an additional instrument at their disposal. Therefore, 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 and 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, however, it generally has less influence on the employment choice, such that profits may be lower, for a given wage. Therefore, not only is there an additional instrument available to determine the size and division of the pie but also the parties' bargaining power changes simultaneously. A qualitatively to some extent comparable mechanism affects the payoff comparison in the presence and absence of CSR activities, which, therefore, deserves closer scrutiny.

The variation in union utility due to a rise in the importance of CRS concerns is given by

$$\frac{dU}{d\gamma} = \left(N_\gamma + N_w \frac{dw}{d\gamma} \right) [u(w) - u(\overline{w})] + N u'(w) \frac{dw}{d\gamma} = N_\gamma [u(w) - u(\overline{w})], \qquad (12)$$

where the second equality sign results from inserting the first-order condition (9). An increase in γ raises labour demand, for a given wage. This raises union utility. Because the trade union sets the wage, a marginal wage variation has no first-order impact on its payoff. Therefore, union utility rises with an increase in the importance, γ, of CRS concerns, and we obtain the following proposition.

PROPOSITION 2. *A greater importance of the CSR objective raises the utility of a wage-setting trade union.*

Proof. See equations (7) and (12). ∎

The variation in profits is

$$\frac{d\pi}{d\gamma} = \pi_N \underbrace{\left(N_\gamma + N_w \frac{dw}{d\gamma} \right)}_{=\frac{dN}{d\gamma}} + \underbrace{\pi_w}_{=-N} \frac{dw}{d\gamma} + \underbrace{\pi_\gamma}_{=0} = -\gamma C'(N) \frac{dN}{d\gamma} - N \frac{dw}{d\gamma}, \qquad (13)$$

where the second equality sign results from equation (5). There are two effects of a variation in γ. First, employment changes. The direct impact of a rise in γ on employment is positive. Because the firm employs more workers than profit maximization requires, this direct effect reduces profits. 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 $\gamma \to 0$, 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-maximizing strength of this objective would be positive if the firm could commit to an employment choice in accordance

with equation (5) at zero costs ($K^{uni}(\gamma) = 0$). We summarize the effect of a CSR objective on profits in the following proposition.

PROPOSITION 3. *If a profit-maximizing 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. Evaluate the derivative in equation (13) at $\gamma = 0$. ∎

Let γ^{max} denote the strength of CSR concerns, which would maximize profits if the firm could commit to an employment choice according to equation (5) at zero costs ($K^{uni}(\gamma) = 0$). 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, $C'(N) = 1$ and a linear utility function, $u' = 1$, we obtain $0 < \gamma^{max} = \overline{w}\frac{(1-\beta)^2}{(1-\beta)^2+\beta} < \overline{w}$ (see appendix A5 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}. Thus, not only does the introduction of a CSR objective enhance profits up to a value of γ^{max} but so do increases in its strength.

4.4. Bargaining about the CSR objective

The bargained level of the relevance of the CSR objective, γ^{bar}, results from the maximization of the Nash product defined in equation (4):

$$\frac{\partial NP(\gamma)}{\partial \gamma} = \mu(\pi(\gamma) - \pi(0))^{\mu-1}\frac{d\pi(\gamma)}{d\gamma}(U(\gamma) - U(0))^{1-\mu}$$

$$+ (1-\mu)(U(\gamma) - U(0))^{-\mu}\frac{dU(\gamma)}{d\gamma}(\pi(\gamma) - \pi(0))^{\mu} = 0$$

$$\iff \mu(U(\gamma) - U(0))\frac{d\pi}{d\gamma} + (1-\mu)\frac{dU}{d\gamma}(\pi(\gamma) - \pi(0)) = 0. \tag{14}$$

Because $dU/d\gamma > 0$ from equation (12), $U(\gamma) > U(0)$ holds. If wages decline with the relevance of the CSR objectives, furthermore, $d\pi/d\gamma > 0$ applies at least for values of γ that are small enough. 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 equation (14) is surely positive for a sufficiently small value of γ. Because $NP(\gamma = 0) = 0$, there exists a positive value of γ, which guarantees that collectively establishing a CSR objective by choosing $\gamma = \gamma^{bar}$ results in a Pareto improvement.[14] This insights gives rise to the following proposition.

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 equation (7) and equations (12) to (14). ∎

We can interpret the result of negotiations about the CSR objective as a movement from an outcome on the labour demand curve towards an efficient bargaining solution in a setting without CSR concerns (cf. Leontief (1946) and McDonald and Solow (1981)

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14 Establishing that the solution to equation (14) constitutes a maximum of the Nash product is beyond the scope of the present analysis. However, for our purpose it is sufficient to show that a $\gamma > 0$ exists, which we denote by γ^{bar}, such that $NP(\gamma^{bar}) > 0$.

for seminal contributions and Haake et al. (2023) for a recent rigorous analytical treatment). In such a framework, negotiations lead to an outcome, which ensures that the slopes of the union's indifference curves, $-(u(w) - u(\overline{w}))/(u'(w)N)$, and the firm's isoprofit contours, $(F'(N) - w)/N$, coincide. Moving from a monopoly-union outcome to an efficient bargaining solution can constitute a Pareto improvement if wages fall. In the present setting, the CSR objective will generally not result in an efficient outcome characterizing a setting without CSR because there is no mechanism at work ensuring that $F'(N) - w = -\gamma C'(N)$ equals $-(u(w) - u(\overline{w}))/u'(w)$. However, if wages fall with the CSR objective, the outcome will move "closer" to the efficient bargaining outcome in a world without CSR concerns.

Because negotiating a CSR objective is unlikely to give rise to an efficient bargaining outcome, the firm and trade union could possibly achieve a further Pareto improvement by changing the bargaining agenda and, for example, agreeing on negotiations about wages and employment. Whether such an opportunity for additional gains actually exists depends, inter alia, on the possibility to choose the bargaining power in the Nash bargain about employment in such a way that the firm and trade union each benefit from the alteration, relative to a setting in which the firm sets employment unilaterally.

Our finding that a Pareto improvement can result if firms offer higher employment—via collectively bargained CSR—in exchange for a lower wage is 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 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 equation (14), 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 exmaple, Ioannou and Serafeim, 2012; Kinderman and Lutter, 2018; Boodoo, 2020; 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. To ensure comparability and exclude effects, which may result from the consideration of additional payoff components, we assume that welfare consists of the sum of profits and union utility. Therefore, γ^{opt} is defined by $\frac{dU}{d\gamma} + \frac{d\pi}{d\gamma} = 0$ (see appendix A1).[15] Evaluating the bargaining solution in equation (14) at γ^{opt}, knowing that $\frac{d\pi}{d\gamma} = -\frac{dU}{d\gamma}$ holds in that case, yields

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15 While the Nash bargaining solution is invariant to an order-preserving variation of the parties' objectives, the utilitarian welfare objective assumes interpersonal comparability of marginal payoffs. Therefore, we juxtapose γ^{bar} and γ^{opt} for a special case, and the outcome of the comparison may depend on the specification of the welfare objective.

$$\frac{\partial NP(\gamma)}{\partial \gamma}\bigg|_{\gamma=\gamma^{opt}} = \mu(U(\gamma^{opt}) - U(0))\left(-\frac{dU}{d\gamma}\right) + (1-\mu)(\pi(\gamma^{opt}) - \pi(0))\frac{dU}{d\gamma}$$

$$= \underbrace{\frac{dU}{d\gamma}}_{>0}[(1-\mu)(\pi(\gamma^{opt}) - \pi(0)) - \mu(U(\gamma^{opt}) - U(0))]. \tag{15}$$

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 A5). 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 importance, 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. Because $\pi(\gamma^{opt}) > \pi(0)$, a higher value of $1 - \mu$ makes a positive derivative in equation (15) more likely. The second condition concerning the concavity of the production function 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 equation (15) is smaller and the derivative is more likely to be positive.

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.

The above discussion is based on the assumption that welfare consists of the sum of the payoffs of the firm and the trade union. However, it may be reasonable to assume that welfare also incorporates the consumers' payoff, insofar as it exceeds the utility obtained by workers. If the consumers' payoff increases in output and employment rises with the relevance of the CSR objective, as it will surely do if the wage set by the trade union declines with γ, a social planner incorporating consumer welfare will choose a higher level of γ than γ^{opt}. In this case, it becomes less likely that the bargained level of the strength, γ^{bar}, exceeds the importance, γ^{opt}, preferred by a social planner.

5. Extensions

In this section, we will analyze the consequences of relaxing three of our modelling assumptions. They are: 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. Third, the firm's

employment choice is conditional not only on the bargained strength of CSR concerns but also on the wage because wages are determined prior to employment (wage–employment bargain). For all three extensions—wage bargaining, positive and finite commitment costs, and an employment–wage bargain—we clarify that the modelling choices do not qualitatively affect our findings. Formal derivations concerning the extensions are relegated to appendices A2 to A4.

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 (see equation (12)). If there is bargaining, though, the union's payoff rises with the wage because the bargained amount falls short of the union's preferred level. Given a negative impact of the CSR objective on the wage, 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 wage level depends on the firm's objective. Because the firm's ultimate objective is the maximization of profits, we hypothesize that it also pursues this aim in wage negotiations, while the CSR objective pertains only to the employment choice.

To analyze the sensitivity of our findings with regard to the assumption of a monopoly trade union, we assume that the payoff in case of no agreement in the Nash bargain about the wage is zero for the firm because no production takes place, while all union members obtain the income $\overline{w}$. Denoting the firm's bargaining power in the wage negotiations by α ($0 \leq \alpha \leq 1$), which may differ from μ, and the trade union's by $1 - \alpha$, the bargained wage in the right-to-manage setting is defined by $\frac{\partial NP(w)}{\partial w} = 0$ (see equation (A2) in appendix A2). The variation in the bargained wage due to a greater strength of the CSR objective is determined by the derivative of $\frac{\partial NP(w)}{\partial w}$ with respect to γ, which is given by

$$\frac{\partial \left(\frac{\partial NP(w)}{\partial w} \right)}{\partial \gamma} = (1 - \alpha)\pi U_{w\gamma} - (1 - \alpha)\gamma C'(N)N_\gamma \frac{dU}{dw}$$
$$+ \alpha N_\gamma [u(w) - u(\overline{w})] \frac{d\pi}{dw} + \alpha [u(w) - u(\overline{w})] N \frac{\partial \left(\frac{d\pi}{dw} \right)}{\partial \gamma}. \tag{16}$$

If the firm has the entire bargaining power ($\alpha = 1$), the "bargained" wage equals $\overline{w}$ 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 equation (16) 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 equation (16) 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, $\frac{\partial \frac{d\pi}{dw}}{\partial \gamma} = -N_\gamma - \frac{d(\gamma C'(N)N_w)}{d\gamma}$, consists of a negative component, N_γ, 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 employment.

In summary, we observe that possibly different, though not necessarily stricter conditions ensure a wage reduction due to a greater intensity of CSR concerns in a Nash wage bargaining framework compared to a monopoly union setting. A reduction in the wage reduces union utility. Therefore, a greater importance of CSR concerns raises union utility in a setting with wage negotiations if the positive impact of higher employment, also present in a monopoly union world, dominates the adverse impact of the decline in the wage.

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-maximizing level at zero costs ($K^{bar}(\gamma) = 0$), while a unilateral choice by the firm is prohibitively expensive ($K^{uni}(\gamma > 0) \to \infty$). 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 the case of a unilateral choice. We retain the crucial restriction concerning the relation between these costs, namely that $K^{bar}(\gamma) < K^{uni}(\gamma)$ holds, and presume $K^{i\prime}(\gamma) > 0$, for $i = bar, uni$.

The modifications concerning commitment costs give rise to two additional effects. First, the bargained and the firm's preferred level of the strength of the CSR objective, γ^{bar} and γ^{uni}, change because the marginal costs of increasing γ are positive. Second, commitment costs can change the incentives to adhere to the employment choice implied by the CSR objective. In the analyses conducted so far, both aspects were irrelevant because we assumed either adherence to the promise of an employment choice (of $N(\gamma^{bar}, w(\gamma^{bar}))$) or the impossibility to do so (for any γ chosen by the firm unilaterally). Moreover, we de facto presumed that the costs of commitment, $K^i(\gamma)$, do not vary with the relevance of the CSR objective.

To succinctly illustrate the consequences of commitment costs, it is helpful to initially focus on positive costs in the case of collective bargaining about γ ($K^{bar}(\gamma) > 0$) and to retain the assumption that a firm cannot commit unilaterally to a positive value of the importance of CSR concerns because commitment costs are prohibitive ($K^{uni}(\gamma > 0) \to \infty$). Subsequently, we add the modification of finite commitment costs in the case of a unilateral choice by the firm. The formal details of the investigation can be found in appendix A3.

Commitment costs $K^{bar}(\gamma)$ reduce profits only in the case of an agreement in the Nash bargain because they do not arise if no consensus about γ can be achieved. Furthermore, positive commitment costs for the firm do not alter the trade union's objective, which continues to be given by equation (1). Positive commitment costs have no impact on labour demand $N(w, \gamma)$ defined in equation (5), on the slope of the labour demand curve $N_w(w, \gamma)$ and on the CSR effect on labour demand $N_\gamma(w, \gamma)$. Therefore, the optimal wage defined in equation (9) and the wage change resulting from a variation in γ as specified in equation (11) also remain the same. However, for $K^{bar\prime}(\gamma) > 0$, profits decline (rise) by more (less) with the relevance of the CSR objective in the presence of positive commitment costs than in their absence.

Using these insights to evaluate the bargained level of the relevance of the CSR objective, γ^{bar}, in the presence of commitment costs, $K^{bar}(\gamma) > 0$, we can observe that two effects reduce the bargained magnitude γ^{bar}. First, there is a more pronounced negative impact of a rise in γ on profits. Second, the firm's gain from bargaining is smaller. Nonetheless, the incentives to establish a positive level of γ persist, as long as the firm's payoff rises.

We next additionally assume that the costs of a unilateral commitment by the firm to a CSR objective, $K^{uni}(\gamma)$, are finite. As commitment costs rise with the relevance of the CSR objective, the profit-maximizing value, γ^{max}, is lower than in the absence of marginal costs of commitment. In addition to the marginal impact, there can also be a level effect. To clarify its consequences, suppose that the firm can credibly commit to an employment level $N(\gamma^{max}, w)$ in the absence of collective negotiations about γ. This ability affects collective bargaining about the relevance of CSR because the firm's payoff in the case of no agreement in the Nash bargain no longer equals $\pi(0)$. Instead, it is given by $\pi(\gamma^{max}) - K^{uni}(\gamma^{max})$. The firm's gain in the Nash bargain 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. However, the firm's gain from bargaining over γ will shrink with $K^{bar}(\gamma)$. Therefore, the Nash bargaining solution will result in a lower bargained level of the strength of the CSR objective, γ^{bar}, than in a setting in which the payoff in the case of no agreement equals $\pi(0)$.

The above considerations indicate that the exact specification of commitment costs does not affect our basic insights under two conditions: 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 unilaterally and, second, the bargained level, γ^{bar}, is positive.

5.3. Sequence of decisions

The standard assumption in collective wage bargaining models is that the determination of wages takes place prior to the choice of employment (Oswald, 1985; Lawson, 2011). Instead of such a wage–employment bargain, also a simultaneous choice of both determinants of profits and union utility, as in the efficient bargaining set-up, or an employment–wage bargain could take place. We discuss the two options in turn.[16]

Suppose, first, that wages and employment are determined simultaneously and an efficient bargaining outcome results. This efficient outcome occurs, irrespective of the sequence of decisions, if the bargaining power of both parties is the same in the negotiations about wages and employment (see Manning, 1987). In consequence, negotiations about CSR in stage one cannot give rise to a Pareto improvement. In the settings we have analyzed above, the firm determines employment unilaterally. Accordingly, the bargaining power of the trade union and the firm differ in the determination of wages and employment, both for the monopoly union and the right-to-manage framework, providing scope for negotiations about CSR to result in higher payoffs for both parties.

An alternative setting with differential bargaining power concerning wages and employment is one in which the firm initially chooses employment and is then locked in by its choice when wages are determined subsequently. If the trade union can set the wage unilaterally in the final, third stage, it will select the highest feasible level. If there are no fixed costs of operation, this maximum wage gives rise to zero profits for any employment choice at stage two. To ensure a unique equilibrium in a model in which employment is determined first, there has to be wage bargaining at stage three, where a higher employment level chosen at stage two reduces the negotiated wage (see Moene (1988) and Lingens (2007)). Nonetheless, for any given wage, employment exceeds the profit-maximizing level and a solution to the right of the labour demand schedule results. We show in appendix A4 that, as long as the firm's bargaining power in wage negotiations in stage three differs from its bargaining power in the determination of employment in stage two and the trade union is risk-averse, the outcome will not be efficient. Accordingly, there is scope for a Pareto improvement due to a credible commitment to a CSR objective in collective negotiations at stage one.[17]

We conclude that a wage–employment bargain provides relatively favourable conditions for a Pareto-improving effect of collective agreements about CSR. However, the same

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16 We are very grateful to a referee for pointing out this possibility of extending and strengthening our analysis.

17 An employment–wage bargain with a risk-neutral trade union results in an efficient outcome (Manning, 1987; Moene, 1988; Lingens, 2007). Therefore, inefficiency requires different risk attitudes of the firm and workers.

qualitative outcome as under a wage–employment bargain can obtain in the case of an employment–wage bargain.

6. Summary and discussion

In this paper, we consider a profit-maximizing 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 maximize profits, at a given wage. 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 maximize 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 maximize 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 employment can make the trade union better off. We clarify that our basic insights can also arise if employment is determined prior to the wage. Therefore, CSR can mitigate the inefficiency arising from collective wage negotiations.

Our findings indicate that 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 centralized 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 and Serafeim (2012), Liang and Renneboog (2017), Kinderman and Lutter (2018) 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.[18] The computations show that

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18 Details of the calculations, based on the model looked at in section 4, are available in the online appendix.

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. 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 10%. Therefore, these calculations emphasize that commitment costs must not be too high for the Pareto gain to be realized. 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 mechanisms, which bring about the possibility of a Pareto improvement, are the features of the CSR objective that it, first, commits the firm to employ more people at a given wage and, second, changes the employment response to a wage change. The first implies that other CSR objectives, which, for example, focus on adverse environmental consequences of production and, therefore, generate an extra payment to the firm for a reduction in output, are likely to induce a higher bargained wage. In consequence, profits decline for two reasons: The firm produces less than the profit-maximizing level of output and it pays higher wages. While such environmentally oriented CSR objectives can raise welfare, the incentives to establish them in collective negotiations may be lower than if employees directly benefit from CSR activities. The empirical evidence showing that the relationship between unionization and CSR depends on the type of CSR considered (Boodoo, 2020; Chen et al., 2020; Heitz et al., 2024) is compatible with the theoretical conclusion. Accordingly, we surmise that the prediction of a Pareto improvement resulting from a collective bargain about a CSR objective is likely to depend on the specification of CSR.

Moreover, our findings concerning the welfare effects of CSR rely heavily on the firm-specific perspective, implying that the sum of profits and union utility matters. If the firm under consideration is large or if our analysis applies to many firm–union relationships, the change in employment and output may have product market effects. In this case, the welfare specification should also include the consumers' payoff. If the consumers' payoff increases in output and if employment rises with the relevance of the CSR objective, as it will surely do if the wage set by the trade union declines with its strength, our setting underestimates the strength of CSR concerns that a social planner incorporating consumer welfare will choose. If, however, output has detrimental environmental or social consequences, such as in the case of unhealthy products, our set-up would overestimate the welfare-maximizing strength of CSR concerns.

In summary, our analysis concerning the desirability for firms and trade unions of establishing a CSR objective jointly and the welfare evaluation of such behaviour may depend both on the specification of the CSR objective and of welfare. Therefore, the interaction between collective bargaining and CSR deserves further attention.

Appendix

A1. Social planner's choice

Suppose, a social planner that maximizes the sum of profits and union utility determines the strength, γ^{opt}, of the CSR objective. 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

$$\frac{dW}{d\gamma} = \frac{d\pi}{d\gamma} + \frac{dU}{d\gamma} = 0$$

$$\Longleftrightarrow -\gamma C'(N)\left(N_\gamma + N_w \frac{dw}{d\gamma}\right) - N\frac{dw}{d\gamma}$$

$$+ \left(N_\gamma + N_w \frac{dw}{d\gamma}\right)[u(w) - u(\overline{w})] + Nu'(w)\frac{dw}{d\gamma} = 0$$

$$\iff \frac{dN}{d\gamma}[u(w) - u(\overline{w}) - \gamma C'(N)] + N(u'(w) - 1)\frac{dw}{d\gamma} = 0. \qquad (A1)$$

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 $d\pi/d\gamma = 0$.

If welfare were given by $W = \pi(\gamma) + U(\gamma) + X(\gamma)$, the social planner's choice of γ would exceed (fall short of) γ^{opt} defined in equation (A1) for $X' > 0$ ($X' < 0$). $X' > 0$ may be a suitable assumption if X describes consumer surplus, while $X' < 0$ could apply if X captures environmental aspects.

A2. Wage bargaining

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, its gain from bargaining equals profits, $\pi = F(N) - wN$. The trade union's gain is given by $N[u(w) - u(\overline{w})]$ because all union members obtain the income $\overline{w}$ 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 in the right-to-manage setting is defined by

$$\frac{\partial NP(w)}{\partial w} = (1 - \alpha)\pi \frac{dU}{dw} - \alpha N[u(w) - u(\overline{w})]\underbrace{(N + \gamma C'(N)N_w)}_{= -\frac{d\pi}{dw}} = 0, \qquad (A2)$$

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 the first-order condition (A2) has an interior solution. Note that if the firm preferred a higher wage than the level that maximized the trade union's payoff, the firm could always pay its employees this higher wage. Hence, it would not realize a gain from bargaining. Thus, the first-order condition (A2) defines an interior solution for $\frac{dU}{dw} > 0$ and $\frac{d\pi}{dw} < 0$. If the Nash product is strictly concave in the wage, w, the variation in w due to a greater strength of the CSR objective is determined by the derivative of the expression in (A2) with respect to γ. Taking into account that $\frac{\partial \pi}{\partial \gamma} = 0$, this derivative is given by equation (16) in the main text, where we also discuss the conditions that have to be fulfilled for the wage to decline with γ.

If the firm's commitment to its CSR objective relates not only to employment but also to the behaviour in wage negotiations, the bargained wage would continue to be defined by the first-order condition (A2), where π is replaced by Z and $\frac{d\pi}{dw}$ by $\frac{dZ}{dw} = N > 0$, because employment maximizes 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

$$\frac{\partial \left(\frac{\partial \widehat{NP}(w)}{\partial w}\right)}{\partial \gamma} = (1 - \alpha)ZU_{w\gamma} - (1 - \alpha)C(N)\frac{dU}{dw}$$

$$- 2\alpha N N_\gamma[u(w) - u(\overline{w})]. \qquad (A3)$$

This derivative is unambiguously negative for $U_{w\gamma} \leq 0$ and $\alpha < 1$.

A3. Costs of commitment

In the presence of commitment costs, the profits ($\pi(N)$) and firm's objective ($Z(N)$), which determine the employment choice in stage three, are no longer defined by equations (2) and (3) but equal

$$Z(N) = \pi(N) + \gamma C(N) = F(N) - wN - K^i(\gamma) + \gamma C(N). \tag{A4}$$

Equation (A4) clarifies that labour demand $N(w, \gamma)$ defined in equation (5)), the slope of the labour demand curve $N_w(w, \gamma)$ and the CSR effect on labour demand $N_\gamma(w, \gamma)$ are unaffected by $K^i(\gamma)$. Hence, the optimal wage, defined in equation (9) and the wage change resulting from a variation in γ, as specified in equation (11), also remain the same.

In the further analysis of commitment costs, we initially focus on positive costs in the case of collective bargaining about γ ($K^{bar}(\gamma) > 0$), and retain the assumption that the costs in the case of a unilateral choice are prohibitive ($K^{uni}(\gamma > 0) \to \infty$). Subsequently, we add the modification of finite commitment costs in the case of a unilateral choice by the firm.

Commitment costs $K^{bar}(\gamma)$ reduce profits only in the case of an agreement in the Nash bargain. These costs do not alter the trade union's objective (see equation (1)). Accordingly, the Nash product, which is maximized to determine the bargained level of the importance of CSR concerns, can be written as

$$NP(\gamma; K^{bar}(\gamma) > 0) = (\pi(\gamma; K^{bar}(\gamma) > 0) - \pi(0))^\mu (U(\gamma) - U(0))^{1-\mu}$$
$$= (\pi(\gamma; K^{bar}(\gamma) = 0) - K^{bar}(\gamma) - \pi(0))^\mu (U(\gamma) - U(0))^{1-\mu}. \tag{A5}$$

Setting the derivative of the Nash product in equation (A5) equal to zero yields

$$\frac{\partial NP(\gamma)}{\partial \gamma} = 0$$

$$\iff \mu(U(\gamma) - U(0)) \frac{d\pi(\gamma, K^{bar}(\gamma) > 0)}{d\gamma}$$

$$+ (1 - \mu) \frac{dU}{d\gamma} (\pi(\gamma; K^{bar}(\gamma) > 0) - \pi(0)) = 0$$

$$\iff \mu(U(\gamma) - U(0)) \left(\frac{d\pi(\gamma, K^{bar}(\gamma) = 0)}{d\gamma} - K^{bar\prime}(\gamma) \right)$$

$$+ (1 - \mu) \frac{dU}{d\gamma} (\pi(\gamma; K^{bar}(\gamma) = 0) - K^{bar}(\gamma) - \pi(0)) = 0. \tag{A6}$$

In equation (A6), the change in profits owing to a rise in the bargained importance of the CSR objective is affected by commitment costs for $K^{bar\prime}(\gamma) > 0$:

$$\frac{d\pi(\gamma; K^{bar}(\gamma) > 0)}{d\gamma} = \pi_N \underbrace{(N_\gamma + N_w \frac{dw}{d\gamma})}_{= \frac{dN}{d\gamma}} + \underbrace{\pi_w}_{=-N} \frac{dw}{d\gamma} + \underbrace{\pi_\gamma}_{=-K^{bar\prime}(\gamma)}$$

$$= \frac{d\pi(\gamma; K^{bar}(\gamma) = 0)}{d\gamma} - K^{bar\prime}(\gamma)$$

$$< \frac{d\pi(\gamma; K^{bar}(\gamma) = 0)}{d\gamma}. \tag{A7}$$

Consequently, profits decline (rise) by more (less) with the relevance of the CSR objective in the presence of positive commitment costs than in their absence.

Given the strict concavity of the Nash product in γ, the profit effect illustrated in equation (A7) is the first reason why the bargained level of the relevance of the CSR objective is lower in the presence of commitment costs ($K^{bar}(\gamma) > 0$) than in their absence ($K^{bar}(\gamma) = 0$). The second reason is that the firm's gain from bargaining is smaller ($\pi(\gamma; K^{bar}(\gamma) > 0) -$

$\pi(0) = \pi(\gamma; K^{bar}(\gamma) = 0) - K^{bar}(\gamma) - \pi(0) < \pi(\gamma; K^{bar}(\gamma) = 0) - \pi(0))$. While both effects reduce the bargained magnitude γ^{bar}, the incentives to establish a positive level of γ persist, as long as $\pi(\gamma^{bar}) - K^{bar}(\gamma^{bar}) > \pi(0)$ applies.

We now assume in addition that the costs of a unilateral commitment by the firm to a CSR objective, $K^{uni}(\gamma)$, are finite. The firm will choose such a positive level γ^{max} if this raises profits and $\pi(\gamma^{max}) - K^{uni}(\gamma^{max}) > \pi(0)$ applies. If the commitment costs rise with the relevance of the CSR objective, the profit-maximizing value, γ^{max}, is lower than in the absence of marginal costs of commitment.

Finite and increasing commitment costs in the case of a unilateral choice also reduce the bargained level, γ^{bar}. This is the case because the payoff in case of no agreement no longer equals $\pi(0)$, but is given by $\pi(\gamma^{max}) - K^{uni}(\gamma^{max})$. Accordingly, the firm's gain in the Nash bargain, as defined in equation (A6), becomes $\pi(\gamma^{bar}) - K^{bar}(\gamma^{bar}) - (\pi(\gamma^{max}) - K^{uni}(\gamma^{max}))$. 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 analysis of section 4 continues to apply.

A4. Alternative sequence of decisions

The trade union and the firm bargain about the importance of the CSR objective in stage one. In stage two, the firm chooses employment to maximize its objective $Z(N) = F(N) - w(N)N + \gamma C(N)$. In stage three, the trade union and the firm bargain about the wage, w. It can be determined by maximizing the Nash product, $NP(w)$, for a given level of employment, N:

$$NP(w) = (F(N) - wN)^\alpha (N[u(w) - u(\overline{w})])^{1-\alpha}, \tag{A8}$$

where the firm's bargaining power equals $\alpha, 0 < \alpha < 1$. The first-order condition for a maximum of $NP(w)$ can be expressed as

$$M = (1-\alpha)(F(N) - wN)u'(w) - \alpha(N[u(w) - u(\overline{w})]) = 0. \tag{A9}$$

The change in the wage owing to higher level of employment, N, is given by

$$\frac{dw}{dN} = -\frac{M_N}{M_w}, \tag{A10}$$

where $M_w = (1-\alpha)(F(N) - wN)u''(w) - Nu'(w) < 0$ for $u''(w) \leq 0$, and M_N equals

$$M_N = (1-\alpha)(F'(N) - w)u'(w) - \alpha N[u(w) - u(\overline{w})]. \tag{A11}$$

The first-order condition for a maximum of $Z(N)$, determined in stage 2, is given by

$$\begin{aligned}
Z_N &= F'(N) - w - N\frac{dw}{dN} + \gamma C'(N) \\
&= F'(N) - w + N\frac{M_N}{M_w} + \gamma C'(N) \\
&= \frac{(F'(N) - w)[(1-\alpha)\pi(N)u''(w) - \alpha Nu'(w)] - N\alpha(u(w) - u(\overline{w}))}{M_w} \\
&\quad + \gamma C'(N) = 0.
\end{aligned} \tag{A12}$$

We assume that the second-order condition holds ($Z_{NN} < 0$). If the wage exceeds the alternative income, $w > \overline{w}$, and the firm's bargaining power is positive ($\alpha > 0$), the firm chooses employment such that $F'(N) - w < 0$ holds for a small enough γ. Moreover, the firm's first-order condition (A12) then implies that the bargained wage declines with

employment ($dw/dN < 0$). The change in the wage resulting from an increase in the bargained importance, γ^{bar}, of the CSR objective is given by

$$\frac{dw}{d\gamma^{bar}} = \frac{dw}{dN}\frac{dN}{d\gamma^{bar}} = -\frac{dw}{dN}\frac{Z_{N\gamma}}{Z_{NN}} \tag{A13}$$

because the wage depends on γ only indirectly via employment, and where $Z_{N\gamma} = C'(N) > 0$. Therefore, the wage declines with the bargained importance, γ^{bar}, of the CSR objective if higher employment lowers the wage. The variation in profits is

$$\frac{d\pi}{d\gamma^{bar}} = -\gamma C'(N)\underbrace{\left(N_\gamma + N_w\frac{dw}{d\gamma}\right)}_{=\frac{dN}{d\gamma}} + \underbrace{\pi_w}_{=-N}\frac{dw}{d\gamma} + \underbrace{\pi_\gamma}_{=0}. \tag{A14}$$

Therefore, profits will surely rise with the introduction of a CSR objective and for a small enough value of the bargained level of the importance of the objective.

The change in union utility $N(\gamma)u(w(N(\gamma))) + (L - N(\gamma))u(\overline{w})$ is given by

$$\frac{dU}{d\gamma^{bar}} = N_\gamma\left[u(w) - u(\overline{w}) + Nu'(w)\frac{dw}{dN}\right]. \tag{A15}$$

Accordingly, union utility rises with a greater importance of the CSR objective if the wage reduction due to higher employment is not too pronounced.

To summarize: Because profits and union utility can increase with γ^{bar}, bargaining about the importance of the CSR objective can bring about a Pareto improvement also in the case of an employment–wage bargain.

A5. Cobb–Douglas specification, linear CSR objective and linear utility

Let the price at which the firm sells its output be unity. The production function is given by $F(N) = N^\beta$, $0 < \beta < 1$. The 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, the firm's employment choice results from the maximization of $Z = N^\beta - wN + \gamma N$. This yields

$$N(w,\gamma) = \left(\frac{w - \gamma}{\beta}\right)^{\frac{1}{\beta-1}}. \tag{A16}$$

Accordingly, the wage elasticity of labour demand equals $\epsilon = \frac{w}{(1-\beta)(w-\gamma)}$ and declines with γ. In order to explicitly calculate the wage, we additionally assume a linear utility function, $u' = 1$.

The union sets the wage to ensure

$$\frac{dU}{dw} = N_w[w - \overline{w}] + N = N\left(1 - \frac{w - \overline{w}}{(w - \gamma)(1 - \beta)}\right) = 0. \tag{A17}$$

From this, we obtain the wage

$$w(\gamma) = \frac{\overline{w} - \gamma(1 - \beta)}{\beta}. \tag{A18}$$

A wage, w, in excess of the fallback wage, $\overline{w}$, requires $\overline{w} > \gamma$. We subsequently assume this restriction to hold. Moreover, the wage falls with a greater relevance of the CSR objective. Using equations (A16) and (A18), the optimal level of employment is

$$N(w(\gamma),\gamma) = \left(\frac{\overline{w} - \gamma}{\beta^2}\right)^{\frac{1}{\beta-1}}. \tag{A19}$$

It follows that

$$\pi(\gamma) = N(w(\gamma), \gamma)^{\beta} - w(\gamma)N(w(\gamma), \gamma)$$

$$= \left(\frac{\overline{w} - \gamma}{\beta^2}\right)^{\frac{\beta}{\beta-1}} - \frac{\overline{w} - \gamma(1 - \beta)}{\beta}\left(\frac{\overline{w} - \gamma}{\beta^2}\right)^{\frac{1}{\beta-1}}$$

$$= \left(\frac{\overline{w} - \gamma}{\beta^2}\right)^{\frac{\beta}{\beta-1}} \left(1 - \beta\frac{\overline{w} - \gamma(1 - \beta)}{\overline{w} - \gamma}\right). \tag{A20}$$

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

$$\frac{d\pi}{d\gamma} = \pi_N\left(N_\gamma + N_w\frac{dw}{d\gamma}\right) + \pi_w\frac{dw}{d\gamma} + \underbrace{\pi_\gamma}_{=0} = 0$$

$$\iff \frac{\left(\frac{\overline{w}-\gamma}{\beta^2}\right)^{\frac{1}{\beta-1}}}{\beta(1 - \beta)}\left[(1 - \beta)^2 - \gamma\frac{\beta}{\overline{w} - \gamma}\right] = 0$$

$$\iff \gamma^{max} = \overline{w}\frac{(1 - \beta)^2}{(1 - \beta)^2 + \beta}. \tag{A21}$$

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 maximizes profits.

Using equations (A18) and (A19), trade union utility can be expressed as

$$U(\gamma) = N(w(\gamma), \gamma)[w - \overline{w}] + M\overline{w} = \left(\frac{\overline{w} - \gamma}{\beta^2}\right)^{\frac{1}{\beta-1}}(1 - \beta)\frac{\overline{w} - \gamma}{\beta} + M\overline{w}. \tag{A22}$$

It follows that

$$\frac{dU}{d\gamma} = \left(\frac{\overline{w} - \gamma}{\beta^2}\right)^{\frac{1}{\beta-1}} > 0. \tag{A23}$$

Using equations (A21) and (A23), we can calculate the social planner's choice of γ, which is defined by

$$\frac{dW}{d\gamma} = \frac{d\pi}{d\gamma} + \frac{dU}{d\gamma} = 0$$

$$\iff \frac{\left(\frac{\overline{w}-\gamma}{\beta^2}\right)^{\frac{1}{\beta-1}}}{\beta(1 - \beta)}[(1 - \beta)^2 - \gamma\frac{\beta}{\overline{w} - \gamma}] + \left(\frac{\overline{w} - \gamma}{\beta^2}\right)^{\frac{1}{\beta-1}} = 0$$

$$\iff \gamma^{opt} = \overline{w}(1 - \beta) > \gamma^{max}. \tag{A24}$$

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:

$$\frac{\partial NP(\gamma)}{\partial \gamma} = \mu((\overline{w} - \gamma)^{\frac{\beta}{\beta-1}} - \overline{w}^{\frac{\beta}{\beta-1}})\frac{1}{\beta^{\frac{2\beta}{\beta-1}}}\left(\frac{\overline{w} - \gamma}{\beta^2}\right)^{\frac{1}{\beta-1}}\left((1 - \beta)^2 - \gamma\frac{\beta}{\overline{w} - \gamma}\right)$$

$$+ (1 - \mu)\frac{1}{\beta^{\frac{2\beta}{\beta-1}}}\left(\frac{\overline{w} - \gamma}{\beta^2}\right)^{\frac{1}{\beta-1}}((\overline{w} - \gamma)^{\frac{\beta}{\beta-1}}\left(1 - \beta\frac{\overline{w} - \gamma(1 - \beta)}{\overline{w} - \gamma}\right)$$

$$- \overline{w}^{\frac{\beta}{\beta-1}}(1 - \beta)) = 0. \tag{A25}$$

To evaluate this derivative at $\gamma = \gamma^{opt}$, we substitute $\gamma = \gamma^{opt} = \overline{w}(1-\beta)$ into equation (A25). Furthermore, to keep the analysis tractable, we set $\overline{w} = 1$, such that

$$\left.\frac{\partial NP(\gamma)}{\partial \gamma}\right|_{\substack{\gamma=\gamma^{opt} \\ \overline{w}=1}} = \mu(\beta^{\frac{\beta}{\beta-1}} - 1)\frac{1}{\beta^{\frac{2\beta}{\beta-1}}}\left(\frac{1}{\beta}\right)^{\frac{1}{\beta-1}}((1-\beta)^2 - (1-\beta))$$

$$+ (1-\mu)\frac{1}{\beta^{\frac{2\beta}{\beta-1}}}\left(\frac{1}{\beta}\right)^{\frac{1}{\beta-1}}(\beta^{\frac{\beta}{\beta-1}}(1-(1-(1-\beta)^2)) - (1-\beta))$$

$$= (\beta-1)\frac{1}{\beta^{\frac{2\beta+1}{\beta-1}}}\left[\underbrace{\mu(\beta^{\frac{\beta}{\beta-1}}-1)\beta}_{(1)} - \underbrace{(1-\mu)[\beta^{\frac{\beta}{\beta-1}}(1-\beta) - 1]}_{(2)}\right]. \quad (A26)$$

The first term in square brackets in the last line of equation (A26) is unambiguously positive (because $\beta < 1$). 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 on the right-hand-side of equation (A26) is positive. Indeed, we can show that for $\mu < \frac{1}{2}$ and $\beta < \frac{7}{25}$ expression (A26) 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}.

Supporting information

Supplementary material accompanies this article.

References

Abriata, B.D., and G. Delautre (2020) "What drives CSR? An empirical analysis on the labour dimensions of CSR," ILO working paper no. 7

Albuquerque, R., and L. Cabral (2023) "Strategic leadership in corporate social responsibility," European Corporate Governance Institute finance working paper no. 788, revised March 2023

Alipranti, M., C. Manasakis, and E. Petrakis (2024) "Corporate social responsibility and bargaining in unionized markets," *Journal of Economic Behavior & Organization* 224, 949–65

Anderson, S., and M. Devereux (1989) "Profit-sharing and optimal labour contracts," *Canadian Journal of Economics* 22(2), 425–33

Appelbaum, E. (2011) "Union–firm bargaining: Order of play and efficiency," *Games and Economic Behavior* 71(2), 235–45

Atkinson, A.B. (1977) "Profit-sharing, collective bargaining and employment risk," *Zeitschrift fur die gesamte Staatsswissenschaft* 133(Special Issue), 43–52

Azariadis, C. (1975) "Implicit contracts and underemployment equilibria," *Journal of Political Economy* 83(6), 1183–202

Baily, M.N. (1974) "Wages and employment under uncertain demand," *Review of Economic Studies* 41(1), 37–50

Bhattacharya, C.B., S. Sen, and D. Korschun (2008) "Using corporate social responsibility to win the war for talent," *MIT Sloan Management Review* 49(2), 37–44

Bolvig, I. (2005) "Firm-provided social concerns? Just another compensating wage differentials story?," *International Journal of Manpower* 26(7-8), 673–704

Boodoo, M.U. (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), 816–43

Booth, A.L. (1995) "Layoffs with payoffs: A bargaining model of union wage and severance pay determination," *Economica* 62 (248), 551–64

Booth, A.L., and M. Chatterji (1998) "Unions and efficient training," *Economic Journal* 108(447), 328−43

Brand, B., and M. Grothe (2015) "Social responsibility in a bilateral monopoly," *Journal of Economics* 115(3), 275−89

Brekke, K.A., and K. Nyborg (2008) "Attracting responsible employees: Green production as labor market screening," *Resource and Energy Economics* 30(4), 509−26

Burbano, V.C. (2016) "Social responsibility messages and worker wage requirements:Field experimental evidence from online labor marketplaces," *Organization Science* 27(4), 1010−28

Carnahan, S., D. Kryscynski, and D. Olson (2017) "When does corporate social responsibility reduce employee turnover? Evidence from attorneys before and after 9/11," *Academy of Management Journal* 60(5), 1932−62

Chantziaras, A., E. Dedoulis, V. Grougiou, and S. Leventis (2021) "The impact of labor unionization on CSR reporting," *Sustainability Accounting, Management and Policy Journal* 12(2), 437−66

Chen, S.X., E. Lee, and K. Stathopoulos (2020) "Does corporate social responsibility spending affect strike risk? Evidence from union elections," SSRN 3708243

De Fraja, G. (1993) "Unions and wages in public and private firms: A game-theoretic analysis," *Oxford Economic Papers* 45(3), 457−69

Deutscher Gewerkschaftsbund (2009) *10-point paper on corporate social responsibility (CSR) adopted by the German Confederation of Trade Unions (DGB) and its affiliates: Binding rules for one and all*

D'Mello, R., S. Kwon, and F. Toscano (2023) "Corporate social responsibility and the executive-employee pay disparity," *Journal of Banking & Finance* 162, 107154

Dowrick, S. (1990) "The relative profitability of Nash bargaining on the labour demand curve or the contract curve," *Economics Letters* 33(2), 121−25

Dustmann, C., and U. Schönberg (2009) "Training and union wages," *Review of Economics and Statistics* 91(2), 363−76

Eguchi, K. (2002) "Unions as commitment devices," *Journal of Economic Behavior & Organization* 47(4), 407−21

Ertugrul, M., and D. Marciukaityte (2021) "Labor unions and corporate social responsibility," *Journal of Banking & Finance* 125, 106061

Fanti, L., and D. Buccella (2017a) "Bargaining agenda in a unionised monopoly with network effects: When corporate social responsibility may be welfare-reducing," *Economia Politica* 34(3), 471−89

——— (2017b) "Corporate social responsibility, profits and welfare with managerial firms," *International Review of Economics* 64(4), 341−56

——— (2018) "Profitability of corporate social responsibility in network industries," *International Review of Economics* 65(3), 271−89

——— (2019) "Corporate social responsibility in a unionised duopoly," *Estudios de Economía* 46(2), 227−44

——— (2020) "Pareto-superiority of corporate social responsibility in unionised industries," *Arthaniti: Journal of Economic Theory and Practice* 19(2), 131−50

——— (2021) "Corporate social responsibility in unionised network industries," *International Review of Economics* 68(2), 235−62

Flammer, C., and A. Kacperczyk (2019) "Corporate social responsibility as a defense against knowledge spillovers: Evidence from the inevitable disclosure doctrine," *Strategic Management Journal* 40(8), 1243−67

Friedman, M. (2002) *Capitalism and Freedom: Fortieth Anniversary edition.* Chicago: University of Chicago Press

Goering, G.E. (2008) "Socially concerned firms and the provision of durable goods," *Economic Modelling* 25(3), 575−583

—— "Corporate social responsibility in a bilateral monopoly," *Managerial and Decision Economics* 35(7), 493−99

Goerke, L. (2022) "Trade unions and corporate social responsibility," *Annals of Public and Cooperative Economics* 93(1), 177−203

Gordon, D.F. (1974) "A neo-classical theory of Keynesian unemployment," *Economic Inquiry* 12(4), 431−59

Greening, D.W., and D. B. Turban (2000) "Corporate social performance as a competitive advantage in attracting a quality workforce," *Business & Society* 39(3), 254−80

Haake, C.-J., T. Upmann, and P. Duman (2023) "Wage bargaining and employment revisited: Separability and efficiency in collective bargaining," *Scandinavian Journal of Economics* 125(2), 403−40

Hedblom, D., B. R. Hickman, and J. A. List (2019) "Toward an understanding of corporate social responsibility: Theory and field experimental evidence," NBER working paper no. 26222

Heinkel, R., A. Kraus, and J. Zechner (2001) "The effect of green investment on corporate behavior," *Journal of Financial and Quantitative Analysis* 36(4), 431−49

Heitz, A., Y. Wang, and Z. Wang (2024) "The power of the people: Labor unions and corporate social responsibility," *Review of Finance.* https://doi.org/10.1093/rof/rfae018

Hogan, C. (2001) "Enforcement of implicit employment contracts through unionization," *Journal of Labor Economics* 19(1), 171−95

Holmlund, B. (1989) "Wages and employment in unionized economies: Theory and evidence." In B. Holmlund, K.-G. Löfgren, and L. Engström, eds., *Trade Unions, Employment, and Unemployment Duration*, pp. 5−131. Oxford, UK: Clarendon Press

Hong, H., and E. Shore (2023) "Corporate social responsibility," *Annual Review of Financial Economics* 15, 327−50

Ioannou, I., and G. Serafeim (2012) "What drives corporate social performance? The role of nation-level institutions," *Journal of International Business Studies* 43(9), 834−64

Iyer, G., and D. A. Soberman (2016) "Social responsibility and product innovation," *Marketing Science* 35(5), 727−42

Jackson, G., V. Doellgast, and L. Baccaro (2018) "Corporate social responsibility and labour standards: Bridging business management and employment relations perspectives," *British Journal of Industrial Relations* 56(1), 3−13

Jerger, J., and J. Michaelis (1999) "Profit sharing, capital formation and the NAIRU," *Scandinavian Journal of Economics* 101(2), 257−75

Khan, M.R., and H. G. Rammal (2022) "The role of trade unions in promoting CSR in Bangladesh's ready-made garments sector: The post-pandemic scenario," *Management Decision* 60(10), 2786−800

Kim, E.H., E. Maug, and C. Schneider (2018) "Labor representation in governance as an insurance mechanism," *Review of Finance* 22(4), 1251−89

Kinderman, D., and M. Lutter (2018) "Explaining the growth of CSR within OECD countries: The role of institutional legitimacy in resolving the institutional mirror vs. substitute debate," MFIfG discussion papers, no. 18/2

Kini, O., M. Shen, J. Shenoy, and V. Subramaniam (2022) "Labor unions and product quality failures," *Management Science* 68(7), 5403−40

Kitzmueller, M., and J. Shimshack (2012) "Economic perspectives on corporate social responsibility," *Journal of Economic Literature* 50(1), 51−84

Kopel, M., and B. Brand (2012) "Socially responsible firms and endogenous choice of strategic incentives," *Economic Modelling* 29(3), 982−89

Koppel, H., and T. Regner (2014) "Corporate social responsibility in the work place," *Experimental Economics* 17(3), 347−70

KPMG (2017) "The road ahead: The KPMG Survey of Corporate Responsibility reporting 2017," 58 pp. https://assets.kpmg.com/content/dam/kpmg/be/pdf/2017/kpmg-survey-of-corporate-responsibility-reporting-2017.pdf

——— (2022) "Big shifts, small steps: Survey of Sustainability reporting 2022," 81 pp. https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2022/10/ssr-small-steps-big-shifts.pdf

Lambertini, L., A. Palestini, and A. Tampieri (2016) "CSR in an asymmetric duopoly with environmental externality," *Southern Economic Journal* 83(1), 236–52

Lambertini, L., and A. Tampieri (2015) "Incentives, performance and desirability of socially responsible firms in a Cournot oligopoly," *Economic Modelling* 50, 40–48

Lawson, N.P. (2011) "Is collective bargaining Pareto efficient? A survey of the literature," *Journal of Labor Research* 32(3), 282–304

Lee, S., and H. Jung (2016) "The effects of corporate social responsibility on profitability," *Management Decision* 54(6), 1383–406

Leontief, W. (1946) "The pure theory of the guaranteed annual wage contract," *Journal of Political Economy* 54(1), 76–79

Liang, H., and L. Renneboog (2017) "On the foundations of corporate social responsibility," *Journal of Finance* 72(2), 853–910

Lingens, J. (2007) "Timing is everything: The labour market effects of union wage bargaining," *Economics Bulletin* 10(5), 1–11

List, J.A., and F. Momeni (2021) "When corporate social responsibility backfires: Theory and evidence from a natural field experiment," *Management Science* 67(1), 8–21

Malcomson, J.M. (1983) "Trade unions and economic efficiency," *Economic Journal* 93(Suppl.), 51–65

Manasakis, C., E. Mitrokostas, and E. Petrakis (2013) "Certification of corporate social responsibility activities in oligopolistic markets," *Canadian Journal of Economics* 46(1), 282–309

——— (2014) "Strategic corporate social responsibility activities and corporate governance in imperfectly competitive markets," *Managerial and Decision Economics* 35(7), 460–73

Manning, A. (1987) "An integration of trade union models in a sequential bargaining framework," *Economic Journal* 97(385), 121–39

McDonald, I.M., and R. M. Solow (1981) "Wage bargaining and employment," *American Economic Review* 71(5), 896–908

Moene, K.O. (1988) "Union's threats and wage determination," *Economic Journal* 98(391), 471–83

Newman, C., J. Rand, F. Tarp, and N. Trifkovic (2020) "Corporate social responsibility in a competitive business environment," *Journal of Development Studies* 56(8), 1455–72

Non, A., I. Rohde, A. de Grip, and T. Dohmen (2022) "Mission of the company, prosocial attitudes and job preferences: A discrete choice experiment," *Labour Economics* 74, 102087

Nyborg, K. (2014) "Do responsible employers attract responsible employees?," *IZA World of Labor* 17. I https://doi.org/10.15185/izawol.17

Nyborg, K., and T. Zhang (2013) "Is corporate social responsibility associated with lower wages?," *Environmental and Resource Economics* 55(1), 107–17

OECD (2019) *Negotiating Our Way Up: Collective Bargaining in a Changing World of Work.* Paris: OECD Publishing

OECD and AIAS (2023) "Institutional characteristics of trade unions, wage setting, state intervention and social pacts," version 1.1. [database]. https://web-archive.oecd.org/temp/2023-10-03/577157-ictwss-database.htm

Oswald, A.J. (1985) "The economic theory of trade unions: An introductory survey," *Scandinavian Journal of Economics* 87(2), 160–93

Petrakis, E., and M. Vlassis (2000) "Endogenous scope of bargaining in a union–oligopoly model: When will firms and unions bargain over employment?," *Labour Economics* 7(3), 261–81

Pita, C. (1997) "Breach penalties in labour contracts: Advance notice and severance pay," *Labour* 11(3), 469–95

Planer-Friedrich, L., and M. Sahm (2020) "Strategic corporate social responsibility, imperfect competition, and market concentration," *Journal of Economics* 129(1), 79–101

Pohjola, M. (1987) "Profit-sharing, collective bargaining and employment," *Journal of Institutional and Theoretical Economics (JITE) / Zeitschrift für die gesamte Staatswissenschaft* 143(2), 334–42

Preuss, L. (2008) "A reluctant stakeholder? On the perception of corporate social responsibility among European trade unions," *Business Ethics: A European Review* 17(2), 149–60

Preuss, L., A. Haunschild, and D. Matten (2006) "Trade unions and CSR: A European research agenda," *Journal of Public Affairs: An International Journal* 6(3-4), 256–68

Scholz, R., and S. Vitols (2019) "Board-level codetermination: A driving force for corporate social responsibility in German companies?," *European Journal of Industrial Relations* 25(3), 233–46