Paying with Purpose[*]

Niko Matouschek[†] Luis Rayo[‡]

March 23, 2026

Abstract

We explore a moral-hazard-in-teams model in which a firm motivates altruistic employees through wages and donations to a cause they value. Because donations are public goods, they scale by rewarding all high-performing employees at once but also leak to low performers. As a result, in the optimal contract, donations reward team performance and complement wages, which reward individual performance. Donations are used more sparingly than wages, require less information, and are especially effective in collaborative environments. They are also conditionally Pareto efficient: efficient when all perform well but fall short when some do not.

Keywords: Moral hazard in teams; public goods; prosocial motivation.

JEL Classification: D82; H41; J33.

---

[*] We thank Luis Garicano, Virginia Minni, and participants at the OPEC workshop and the VSET seminar series for valuable comments. We acknowledge the use of OpenAI's ChatGPT to assist with drafting, editing, and formatting; all interpretations and any errors are our own.

[†] Kellogg School of Management, Northwestern University.

[‡] Kellogg School of Management, Northwestern University.

1 Introduction

Employees care about more than pay and benefits; many care about the broader value they create and who captures it (Rosen 1986; Cassar and Meier 2018). Such altruistic preferences allow firms to shape employee behavior by pursuing prosocial purposes rather than profit alone: they can attract and motivate employees by supporting the causes they care about.

In 2024, U.S. companies donated \$44 billion to causes ranging from health and social services to education, community development, the environment, and the arts. Even as many firms pulled back from some politically charged areas, this level of giving represented an almost ten percent increase from the previous year (Giving USA Foundation 2025).

We explore one explanation for this growing largesse: profit-maximizing firms may donate to prosocial causes to motivate altruistic employees. Specifically, we study a moral-hazard-in-teams model, in the spirit of Holmström (1982), in which agents care about both their pay and a prosocial cause to which the principal can donate. The principal designs a contract that maps team output and individual performance signals into pay and a donation, after which each employee privately chooses effort.

The key feature of donations is that they are public—non-rival and non-excludable. Non-rivalry creates scale: a dollar spent on one deserving agent also rewards all others who performed well. Non-excludability, though, creates leakage: the same dollar also rewards those who did not perform well. Donations are thus most attractive when success is broad, when each dollar is leveraged across many deserving agents and leaks only to a few undeserving ones. In contrast to donations, pay is private and can be targeted at individual agents.

The optimal contract therefore uses wages to reward individual performance and donations to reward team performance: an agent's wage depends on his likelihood ratio—his individual *score*—while donations are tied to the *team score*, the sum of all individual scores. Because donations depend on the team score rather than on individual scores alone, they are used more sparingly than wages: whenever the principal makes a donation, she also pays wages, but not necessarily the reverse. At the same time, donations are not a rare exception. If the score distribution is symmetric, for instance, donations occur at least half the time.

Donations also require less information than wages. Setting wages demands detailed individual data—the full vector of individual scores—while the donation is based on score aggregates. If utility is separable, it requires only a single summary of team performance: the team score. In many environments, this means the donation can be a simple function of team output, while wages must still depend on individual productivity signals.

The effectiveness of donations, in turn, depends on the production environment. Donations are especially well suited to settings in which production is highly collaborative and individual performance is hard to disentangle. High correlation across agents' scores then limits leakage and tilts incentives toward donations. Team size, by contrast, has an ambiguous effect, as adding agents both expands scale and dilutes individual influence on team performance.

Beyond these positive results, the model has a normative implication: donations are *conditionally* Pareto efficient. For a given outlay, the split between pay and donations is Pareto efficient when all scores are weakly positive, but not when at least one is strictly negative. When all employees perform well, the principal rewards everyone without distortion. When at least one performs poorly, the principal reduces the donation to limit leakage, and may even reduce it below what employees would give on their own.

The baseline model abstracts from several features of corporate giving that we explore next. If employees can make donations themselves, high performers may top up the firm's donation when their peers perform poorly, undermining the incentives the firm seeks to provide. To preempt this leakage, the firm caps wages. The profit-maximizing response to employee donations is thus not to leave social giving to individuals, as Milton Friedman famously advocated (Friedman 1970). Instead, it is to continue giving while limiting employees' ability to top up, leading to a more egalitarian wage structure.

Our results extend to firms supporting the causes their employees care about through distortions in production decisions, such as overinvesting in pollution abatement, rather than through donations. Allowing for such indirect support broadens the interpretation of purpose. What the model requires is a shared concern that is non-rival and non-excludable. This concern may reflect altruism, but it may equally take the form of a shared mission, in which employees value the outcomes their work generates. Engineers at SpaceX may value space exploration, for instance, or programmers at OpenAI may value advances in artificial intelligence. Support for such mission-based purpose is naturally provided through production decisions rather than donations. These instruments work similarly, but distortions may allow firms to punish poor performance by contributing less than the profit-maximizing amount.

Finally, the effectiveness of donations depends on whether employees care about the same causes. When employees have heterogeneous preferences and the firm cannot observe them, scale is limited: rewarding good team performance requires supporting many causes rather than one, reducing the leverage of donations and lowering profits. If, however, firms can observe which causes employees support, heterogeneity also limits leakage by allowing donations to be targeted, so its effect on profits is generally ambiguous. The extent to which purpose favors homogeneity therefore depends on whether employee preferences are observable.

2 Related literature

We connect to the classic literatures on moral hazard and public goods. In the literature on moral hazard, we build on Holmström (1982)'s analysis of incentive contracts in teams where performance signals may be correlated. Our contribution is to introduce donations to a public good as a second incentive instrument and examine their interplay with pay.

The starting point of the literature on public goods is Samuelson (1954), who shows that private provision falls short of efficiency. Most of the subsequent literature examines government interventions to address this underprovision. Early work studies provision through taxation, building on Lindahl (1919) and Musgrave (1959) and, with private valuations, Groves and Ledyard (1977) and Green and Laffont (1979). Later work examines whether redistribution of income can mitigate underprovision. Bergstrom, Blume, and Varian (1986) show that when individuals donate independently, redistribution cannot raise private provision.

Our paper belongs to a more recent strand that studies public-good provision by firms. Kotchen (2006) allows firms to bundle their products with a fixed per-unit donation—a constant amount given for each unit sold. He shows that, unless firms have a technological advantage in making donations, such bundles do not raise aggregate giving. Besley and Ghatak (2007) retain the fixed-per-unit structure but let firms choose the donation share. They show that when only some consumers value the public good, the market segments, with some firms donating and others serving regular consumers. As in Kotchen (2006), aggregate donations remain unchanged and the underprovision of the public good persists.

We contribute to this literature by studying firms that donate to motivate employees rather than attract consumers, and by relaxing the assumption that donations are fixed per unit of output. Allowing donations to depend flexibly on the entire vector of performance signals yields conditional efficiency. Even though the firm has no technological advantage in making donations, aggregate giving is efficient when all agents perform well but falls short when some perform poorly; and it may even drop below what agents would give on their own.

Our paper also contributes to two related literatures: Corporate Social Responsibility (CSR) and meaning and purpose at work. The CSR literature examines why profit-maximizing firms engage in prosocial activities (see Kitzmueller and Shimshack (2012) for a survey). Bénabou and Tirole (2010) provide a taxonomy with three interpretations: CSR as a means of achieving Pareto improvements that arise from managerial short-termism or other agency frictions; CSR as delegated philanthropy, where firms undertake prosocial actions on behalf of altruistic stakeholders; and CSR as insider-initiated philanthropy, where managers abuse corporate resources to pursue their own social preferences.

Our paper fits within the notion of delegated philanthropy. We show that while such delegation can solve the underprovision problem in principle, it suffers from an incentive conflict: firms donate to motivate employees, not to maximize their collective well-being. This conflict leads firms to distort donations, reducing them when some employees perform poorly and capping wages to preempt employees' topping up.

The literature on meaning and purpose at work explores the notion that employees care about whom they work for, what they work on, and who benefits from their work (Besley and Ghatak 2005; Akerlof and Kranton 2005; Bénabou and Tirole 2006; Prendergast 2007, 2008; Henderson and Van den Steen 2015, among others). We contribute to this literature by focusing on the public-good nature of purpose, which we argue is a key difference between it and traditional monetary and nonmonetary rewards. This perspective motivates our focus on how a firm designs incentives for employees jointly rather than one at a time. A further contribution is to let the firm choose the intensive margin of purpose—how strongly to support it—rather than only the extensive one. Finally, in our model, purpose is not a fixed job attribute but a state-contingent incentive instrument: the firm's support for its purpose is conditional on the employees' performance.

The empirical strand of this literature provides evidence that employees care about the purpose and meaning of their work (for a survey, see Cassar and Meier (2018)). Ariely, Kamenica, and Prelec (2008) find in a lab experiment that perceived meaning increases effort and lowers reservation wages. Ashraf, Bandiera, and Jack (2014) show in a field experiment that nonmonetary rewards emphasizing the social impact of workers' tasks raise performance in public-service delivery. Spenkuch, Teso, and Xu (2023) provide field evidence that the productivity of U.S. civil servants rises when they are politically aligned with the administration in power, highlighting the role of mission alignment in effort provision.

Directly related to our setting, several experimental studies find that workers exert more effort when their work generates donations (Imas (2014); Tonin and Vlassopoulos (2015); DellaVigna and Pope (2018), among others). Gosnell, List, and Metcalfe (2020) provide field evidence: airline captains at Virgin Atlantic improved fuel efficiency when charitable donations were tied to performance targets, with productivity gains comparable to standard targets but higher job satisfaction. Together, these studies suggest that some employees care enough about prosocial causes for donations to serve as incentive instruments.

The broader empirical literature also explores other forms of meaning at work, such as the discovery of one's own purpose (Ashraf, Bandiera, Minni, and Zingales 2025). What this literature does not provide is direct evidence that firms pursue prosocial causes to motivate employees—rather than to attract consumers or other stakeholders—or how they do so. The next section presents examples and patterns of corporate giving that speak to these questions.

3 Motivating Examples

EPI-USE, one of the world's largest SAP implementers, illustrates that corporate giving can be directed at employees rather than at customers or investors (Feferman and Grandinetti 2022). A few years ago, this South African company pledged to donate one percent of its revenue to the conservation of elephants and rhinos and renamed itself Group Elephant. Its clients are other businesses that care about price and quality, not wildlife conservation, and there is little evidence that the company's purpose attracted prosocial clients or investors.

This was also not the goal. Instead, the initiative was introduced to make work more meaningful for employees. The CEO explained that while the firm was profitable, many senior managers were experiencing a *"crisis of purpose."* He hoped that donating one percent of revenue to social causes would give the firm's financial goal of generating \$1 billion in revenue greater meaning. Anecdotal evidence suggests it had the desired effect: a managing director, for instance, stayed with the company because the new purpose *"resonated with me profoundly at a personal level ... Here was a chance to contribute to society as part of my day-to-day work"* (Feferman and Grandinetti 2022).

Group Elephant is no exception. Many firms use prosocial commitments to engage their employees. Corporate law firms, for example, enable lawyers to devote part of their time to pro bono work. These programs are unlikely to sway clients—most of whom are other corporations committed to maximizing profits—but they appeal to lawyers who seek meaning and social impact in their work.

Other examples include firms that share their prosocial efforts with employees but do not advertise them to customers. A significant share of the profits of the candy manufacturer Hershey's, for instance, benefits the Milton Hershey School, a boarding school for underprivileged children and the company's de facto owner (ProPublica 2021). Hershey's also supports related causes, including the Penn State Children's Hospital and the Children's Miracle Network, where employees volunteer their time (The Hershey Company 2024). These efforts are not hidden from the public but are not prominent in the company's marketing. They appear aimed primarily at employees. As Hershey's president explained, *"People connect with our founder's story. They want to be a force for good. The purpose part is an important glue. It's such a motivator for our employees"* (Mainwaring 2019).

These examples suggest that some firms use prosocial giving to motivate employees rather than to influence customers or investors. Broader patterns of corporate giving point in the same direction. A first pattern is that firms tend to commit to a single, well-defined purpose rather than to multiple or shifting causes. TOMS focuses on poverty alleviation, Patagonia on environmental conservation, and Warby Parker on vision care (TOMS 2024; Patagonia

2024; Warby Parker 2024). Their purposes are stable over time and shared across employees, rather than fleeting or personalized.

Exceptions do exist. Many companies, for example, offer matching-gift programs that let employees support their own preferred charities and sponsor Employee Resource Groups in which like-minded employees support specific causes. Some use platforms such as Phin to reward individual employees with dollar amounts they can donate to charities of their choice (Phin 2025; TriplePundit 2024). Yet these individualized mechanisms resemble traditional nonmonetary benefits more than a shared corporate purpose: they reward employees privately rather than collectively.

A second pattern is that corporate donations are typically linked to team rather than individual performance. Firms commonly base their giving on firmwide outcomes such as profits, revenues, or units sold: TOMS links donations to profits, Patagonia to sales, and Warby Parker to the number of glasses sold. In each case, the underlying performance metric reflects the success of the firm as a whole, not that of any individual employee.

A third pattern is that the rules governing donations require less information than those used to set pay. Firms invest heavily in performance evaluation systems—calibrated ratings, scorecards, and managerial assessments—to determine compensation. In contrast, rules that translate team performance into donations tend to be simple: they commit the firm to donate a constant share of a broad performance measure and do not depend on how well individual employees performed relative to one another. TOMS, for example, donates thirty percent of profits, Patagonia one percent of sales, and Warby Parker one pair per pair sold.

A fourth pattern is that many firms follow threshold-based giving rules. Firms that commit to donating a share of profits suspend giving when they make losses. By contrast, schemes tied to revenue or units sold have only a trivial threshold: they generate positive donations as long as any sales occur, which is almost always the case for an active firm. Such rules therefore lack the threshold structure that is central to the incentive mechanism in this paper, potentially weakening the motivational effect of donations.

A final pattern is that donations are often associated with teamwork and collaboration. Using data from more than 400 U.S. firms, for instance, Gartenberg, Prat, and Serafeim (2019) find that many firms whose employees report a strong sense of purpose also report high levels of camaraderie among co-workers. While the evidence is associative rather than causal, it is suggestive of a link between purpose, teamwork, and collaboration.

The model we turn to next speaks directly to these patterns.

4 The Model

There is a principal and $n \geq 2$ identical agents, working in a team. Agent i privately chooses effort $a_i \geq 0$ at cost a_i. The effort profile $\boldsymbol{a} = (a_1, \ldots, a_n)$ stochastically generates output y and performance signals $\boldsymbol{s} = (s_1, \ldots, s_n)$ via a continuously differentiable joint density $f(y, \boldsymbol{s} \mid \boldsymbol{a})$.

For each agent i, define the likelihood ratio, or *score*, as

$$\ell_i(y, \boldsymbol{s} \mid \boldsymbol{a}) \;:=\; \frac{\partial}{\partial a_i} \log f(y, \boldsymbol{s} \mid \boldsymbol{a}).$$

To simplify notation, we will at times write ℓ_i without arguments when the dependence is clear from context. We follow the same convention for other objects defined below. The score ℓ_i is a standard measure of the agent i's performance (Holmström 1979). The sums $\sum_{j \neq i} \ell_j$ and $\sum_i \ell_i$ similarly capture the aggregate performance of agent i's peers and of the team as a whole. We refer to the first as agent i's *peer score* and the second as the *team score*.

The principal is risk neutral and cares about profits $y - \sum_i w_i - G$, where $w_i \geq 0$ is the wage paid to agent i and $G \geq 0$ is a donation (or *gift*) to a cause the agents care about. Agent i's utility is $u(w_i, G) - a_i$, with u twice continuously differentiable, strictly increasing and strictly concave. Because the evidence is mixed on whether monetary incentives crowd in or crowd out prosocial motivation, we do not restrict the sign of u_{wG} (Bowles and Polanía-Reyes 2012). We do assume that it remains bounded for small G and finite w, so that a small donation does not create extreme sensitivity between wages and benefits. We also impose Inada conditions at both ends:

$$\lim_{w \to 0^+} u_w(w, G) = \lim_{G \to 0^+} u_G(w, G) = +\infty \qquad \text{and} \qquad \lim_{w \to \infty} u_w(w, G) = \lim_{G \to \infty} u_G(w, G) = 0.$$

We adopt the standard approach of taking the desired effort profile $\boldsymbol{a}$ as given and focusing on the relaxed problem in which only the agents' first-order conditions for effort need to be satisfied (Holmström 1979). The principal thus chooses a contract $(\boldsymbol{w}(\cdot), G(\cdot))$ to solve

$$\max_{\boldsymbol{w}, G} \mathbb{E}\left[y - \sum_i w_i(y, \boldsymbol{s}) - G(y, \boldsymbol{s}) \right] \tag{1}$$

subject to the incentive compatibility constraint

$$\mathbb{E}_{y,\boldsymbol{s}|\boldsymbol{a}}\left[\ell_i \cdot u\big(w_i(y, \boldsymbol{s}), G(y, \boldsymbol{s})\big) \right] \geq 1 \qquad \text{for each } i, \tag{2}$$

and pointwise feasibility: $w_i \geq 0$ and $G \geq 0$ for all $(y, \boldsymbol{s})$. We assume that the agents' participation constraints do not bind, allowing the principal to focus exclusively on providing incentives, and restrict attention to symmetric effort profiles.

For each realization $(y, \boldsymbol{s})$, define the principal's *outlay* as

$$M(y, \boldsymbol{s}) := \sum_i w_i(y, \boldsymbol{s}) + G(y, \boldsymbol{s}). \tag{3}$$

The Lagrangian for the principal's problem is then given by

$$\begin{aligned}\mathcal{L} = \mathbb{E}_{y,\boldsymbol{s}|\boldsymbol{a}}\Bigg[&y - M + \lambda \sum_i \left(\ell_i \cdot u\left(w_i, M - \sum_j w_j\right) - 1\right) \\ &+ \sum_i \mu_i\ (y, \boldsymbol{s})\, w_i + \nu\ (y, \boldsymbol{s}) \left(M - \sum_j w_j\right)\Bigg],\end{aligned} \tag{4}$$

where λ is the multiplier on each agent's incentive constraint, the same for all agents because they are identical. The multipliers $\mu_i\,(y, \boldsymbol{s}) \geq 0$ and $\nu\,(y, \boldsymbol{s}) \geq 0$ enforce the feasibility conditions on $w_i\,(y, \boldsymbol{s})$ and $G\,(y, \boldsymbol{s})$, respectively.

5 Optimal Contract

The optimal contract is shaped by the key difference between wages and donations: wages are private goods, while donations are a public one. This difference is reflected in the principal's problem (1) and (2), in which wage w_i enters only agent i's incentive constraint, while the donation G enters the constraints of all agents.

We begin by exploring how the principal should split an arbitrary outlay $M > 0$ between wages and donation. For any given state $(y, \boldsymbol{s})$, the split $(\boldsymbol{w}, G)$ affects the principal's problem only through the incentive constraints. The principal therefore chooses the split that maximizes the aggregate incentive slack subject to feasibility:

$$\max_{\boldsymbol{w},G} \sum_i \ell_i\, u(w_i, G) \quad \text{subject to} \quad \sum_i w_i + G = M, \;\; w_i, G \geq 0. \tag{5}$$

This problem amounts to a weighted allocation of a fixed budget, where the weights are the agents' scores. Our first proposition shows that the resulting split is *conditionally* Pareto efficient: efficient when all scores are weakly positive, but not when at least one is strictly negative.

Proposition 1. *Let* $(\boldsymbol{w}^*(y,\boldsymbol{s}), G^*(y,\boldsymbol{s}))$*, with corresponding outlay* $M^*(y,\boldsymbol{s})$*, denote a wage–donation allocation that solves the principal's problem. In any state* $(y,\boldsymbol{s})$ *where* $M^*(y,\boldsymbol{s}) > 0$*, the allocation is Pareto efficient if and only if every agent's score* ℓ_i *is weakly positive.*

Intuitively, when all scores are weakly positive, the principal wants to reward everyone and does so by splitting the outlay efficiently to maximize the overall reward. When some scores are negative, in contrast, donations benefit agents the principal would rather penalize. To limit this leakage, she sacrifices efficiency by allocating too little to the donation.

To put Proposition 1 in context, it is useful to contrast our setting with an alternative—the *decentralized donation benchmark*—in which the agents themselves decide how much to donate. Suppose, in particular, that instead of implementing the optimal contract $(\boldsymbol{w}^*(y,\boldsymbol{s}), G^*(y,\boldsymbol{s}))$, the principal forgoes the donation and distributes it as additional wages. Gross pay is thus $\boldsymbol{w}^*(y,\boldsymbol{s}) + \boldsymbol{d}$, where $\sum_i d_i = G^*(y,\boldsymbol{s})$. After receiving their wages, the agents decide simultaneously and independently how much to donate, with agent i donating $g_i \in [0, w_i^*(y,\boldsymbol{s}) + d_i]$.

The next proposition shows that the agents' aggregate donation in this benchmark may be below or *above* the principal's optimal donation $G^*(y,\boldsymbol{s})$.

Proposition 2. *Let* $(\boldsymbol{w}^*, G^*)$ *be the optimal split in a state with* $M^* > 0$*, and let* G^{**} *denote the agents' aggregate donation in the decentralized donation benchmark.*

1. *There exist states* $(y,\boldsymbol{s})$ *such that* $G^{**} < G^*$ *for some distribution* $\boldsymbol{d}$ *of* G^**. This occurs, for instance, when all agents' scores are identical and strictly positive.*
2. *There exist states* $(y,\boldsymbol{s})$ *such that* $G^{**} > G^*$ *for some distribution* $\boldsymbol{d}$*. This occurs, for instance, when one agent's score is strictly positive and all others are strictly negative.*

The ambiguity in the relative size of the donations arises from the fact that agents do not internalize the externalities their donations impose on the principal. The signs of these externalities depend on whether the principal wishes to reward or punish an agent's peers. When all scores are strictly positive, for example, each agent's donation benefits only agents the principal also wishes to reward. Since each agent ignores the benefit his donation confers on the other high-performing agents, decentralized giving may fall short of the principal's donation. By contrast, when one agent's score is strictly positive and the others' scores are strictly negative, that agent's donation benefits peers the principal would rather penalize. Because the principal internalizes this negative externality, she may donate less than employees do on their own.

Having characterized the optimal split of a given outlay, we turn to the choice of the outlay itself. Differentiating the Lagrangian (4) with respect to M yields

$$\lambda \sum_i \ell_i u_G(w_i, G) = 1 - \nu. \tag{6}$$

To interpret this condition, consider states where $G > 0$ and hence $\nu = 0$. The left-hand side then represents the score-weighted marginal benefit of increasing the outlay, while the right-hand side captures the marginal cost. When both the multiplier λ on the agents' incentive constraints and all likelihood ratios are equal to one, this condition coincides with the classic Lindahl condition for the efficient provision of public goods (Lindahl 1919). Our condition differs because the principal values donations only to provide incentives, causing her to account for the multiplier and to weigh each agent's marginal utility by his score.

Together, the conditions for the optimal outlay and its split determine the solution to the principal's problem.

Proposition 3. *Every optimal contract* $(\boldsymbol{w}^*, G^*)$ *satisfies the sign tests*

$$w_i^* > 0 \iff \ell_i > 0,$$

$$G^* > 0 \iff \sum_j \ell_j > 0 \text{ if } u_{wG} \leq 0, \text{ and}$$

$$G^* > 0 \Leftarrow \sum_j \ell_j > 0 \text{ if } u_{wG} > 0.$$

Moreover, whenever $w_i^* > 0$ *we have* $\lambda \, \ell_i \, u_w(w_i^*, G^*) = 1$*, and whenever* $G^* > 0$ *we have* $\lambda \sum_j \ell_j \, u_G(w_j^*, G^*) = 1$.

Each agent's wage therefore depends directly on his own score, and on the other agents' scores only indirectly through the donation. By contrast, for given wages, donations depend on the *weighted team score*, the sum of scores weighted by marginal utilities. This difference reflects the public nature of donations. An extra dollar in wages can be targeted to reward individual performance, whereas an extra dollar in donations benefits all agents, scaling across high performers but also leaking to low performers. As a result, the principal uses wages to reward individual performance and donations to reward broad-based performance.

The principal makes a donation if the unweighted team score is positive and refrains from doing so when it is negative, unless wages and donations exhibit strictly increasing differences. In that case, a negative team score does permit a donation, but only when the best agent's performance is sufficiently strong to raise his wage—and hence his marginal utility from the donation—enough to justify its leakage to low-performing peers.

Donations are therefore used more sparingly than wages: if the principal makes a donation, she also pays wages, but not necessarily the reverse. Yet, because the team score has zero mean, donations are not a rare exception. If the score distribution is symmetric, for instance, donations occur at least half the time.

A simple special case arises when utilities are separable, $u(w, G) = v(w) + r(G)$, a common benchmark in the literature on incentives and social preferences (Bowles and Polanía-Reyes 2012). Optimal wages and donations are then given by

$$w_i^* = \big(v'\big)^{-1}\Big(\frac{1}{\lambda\,\ell_i^+}\Big) \qquad \text{and} \qquad G^* = \big(r'\big)^{-1}\Big(\frac{1}{\lambda\,(\sum_i \ell_i)^+}\Big), \tag{7}$$

where $x^+ = \max\{x, 0\}$. Separability thus fully decouples the instruments: wages depend only on individual scores, donations only on the team score.

The fact that donations reward team performance while wages reward individual performance implies a second, related distinction: donations require less information than wages. To set wages, the principal must evaluate agents' scores separately in order to target each agent. By contrast, donations reward all agents and are therefore determined by a single aggregate optimality condition. Under separability, this condition depends only on a single scalar, the team score.

Corollary 1. *Suppose utility is separable. Then the wage vector depends on the full vector of scores, while the donation depends on scores only through a single scalar, the team score.*

In some environments the difference in informational requirements is especially stark: donations depend only on team output y, while wages depend on both y and the agents' individual signals $\boldsymbol{s}$. The next proposition makes use of the decomposition $f(y, \boldsymbol{s} \mid \boldsymbol{a}) = g(y \mid \boldsymbol{a})h(\boldsymbol{s} \mid y, \boldsymbol{a})$ to show when this occurs.

Proposition 4. *Suppose utility is separable and*

$$\sum_i \frac{\partial}{\partial a_i} \log h(\boldsymbol{s} \mid y, \boldsymbol{a}) = 0 \quad \text{for all } (y, \boldsymbol{s}, \boldsymbol{a}). \tag{8}$$

Then the optimal donation $G^*(y, \boldsymbol{s})$ depends only on team output y, not on the individual signals $\boldsymbol{s}$.

The distributional condition holds when, given output y, the signals $\boldsymbol{s}$ reveal the distribution of effort across agents but not its aggregate level. Formally, the conditional distribution of $\boldsymbol{s}$ is invariant to common shifts in effort and depends only on differences in effort. Because the donation rewards aggregate effort, the principal can then ignore the signals.

To illustrate the proposition, consider a Gaussian model with additive common and idiosyncratic shocks that satisfies the distributional condition. Let $y = \sum_j a_j + n\varepsilon_0$ with common shock $\varepsilon_0 \sim \mathcal{N}(0, \sigma_0^2)$ and $s_i = a_i + \varepsilon_0 + \varepsilon_i$ with independent shock $\varepsilon_i \sim \mathcal{N}(0, \sigma_s^2)$. Each agent's score then decomposes into an absolute component generated by the common shock and a relative component generated by the idiosyncratic shocks:

$$\ell_i = \frac{1}{n^2\sigma_0^2}(y - na) + \frac{1}{\sigma_s^2}(s_i - \bar{s}),$$

where a bar denotes the average across agents. Summing across agents, the relative terms cancel out, and hence the team score depends only on the common shock:

$$\sum_j \ell_j = \frac{1}{n\sigma_0^2}\Big(y - na\Big).$$

Wages therefore depend on relative performance, as in Holmström (1982); donations, by contrast, depend only on output y. If $u(w, G) = \log w + \log G$, for instance,

$$G^*(y) = \lambda \frac{1}{n\sigma_0^2} \max\Big\{y - na, 0\Big\}.$$

The donation is independent of the signals and scales linearly with output above expectations.

Next, we examine how donations vary with the production environment, such as the extent of collaboration and team size. These features enter the principal's problem via their effect on the distribution of scores and, through it, on the incentive-constraint multiplier.

We begin with an increase in correlation: a change in the joint distribution of scores that keeps the marginal distributions fixed while generating a mean–preserving spread of the team score. Scores are more correlated when, other things equal, production is more collaborative. To illustrate, consider a generalization of the Gaussian example in which

$$y = t(c)\sum_j a_j + n\varepsilon_0 \qquad \text{and} \qquad s_i = t(c)\big((1-c)a_i + c\bar{a}\big) + \varepsilon_0 + \varepsilon_i,$$

where $c \in [0, 1]$ captures effort spillovers, reflecting collaboration, and

$$t(c) = \left[1 - \frac{n(n-1)}{\sigma_\varepsilon^2/\sigma_0^2 + n(n-1)} c(2-c)\right]^{-1/2}$$

rescales output and the signals so that changes in c affect only the correlation structure of scores, not their marginal distributions. The pairwise correlation coefficient of the scores is

$$\operatorname{Corr}(\ell_i, \ell_j) = \frac{\sigma_\varepsilon^2/\sigma_0^2 - n(1-c)^2}{\sigma_\varepsilon^2/\sigma_0^2 + n(n-1)(1-c)^2},$$

which is increasing in c.

The next proposition shows that, under a curvature condition, higher correlation relaxes the incentive constraint. To state the result, let $A_r(G)$ denote absolute risk aversion with respect to the donation.

Proposition 5. *Suppose utility is separable and exhibits decreasing absolute risk aversion with respect to the donation, $A_r'(G) \leq 0$. Then, an increase in the correlation of the scores lowers the incentive multiplier λ.*

Correlation relaxes the incentive constraint because it reduces leakage, which strengthens the incentive effect of donations. Using symmetry, we can write the incentive constraints as

$$\mathbb{E}\big[\ell_i\, v(w_i^*)\big] + \frac{1}{n}\,\mathbb{E}\big[\sum_j \ell_j r(G^*)\big] \geq 1.$$

Decreasing absolute risk aversion implies that $\sum_j \ell_j r(G^*)$ is convex in $\sum_j \ell_j$, so that a mean–preserving spread of $\sum_j \ell_j$ raises the donation term and relaxes the incentive constraint.

A lower multiplier implies, for a given effort profile, a reduction in both donation and wages. The next proposition provides conditions for the donation to fall by less, and thus rise relative to wages.

Proposition 6. *Suppose utility is separable and exhibits constant relative risk aversion, with $v'(w) = w^{-\gamma_v}$ and $r'(G) = \alpha G^{-\gamma_r}$ for some $\alpha > 0$, and $\gamma_v \leq \gamma_r \leq 1$. Then an increase in correlation among individual scores raises the donation–wage bill ratio $\mathbb{E}[G^*]/\mathbb{E}[\sum_i w_i^*]$.*

The condition $\gamma_r \leq 1$ ensures that the optimal donation is convex in the team score, so that a mean–preserving spread raises $\mathbb{E}[G^*]/\mathbb{E}[\sum_i w_i^*]$ for given λ. The condition $\gamma_v \leq \gamma_r$, in turn, ensures that the reduction in λ also raises the donation–wage bill ratio. Coefficients below one are commonly used in empirical agency models (Georgiadis and Powell 2022).

Lastly, team size has an ambiguous effect on incentive provision. A larger team raises dispersion in the team score but also reduces each agent's influence on it. Dispersion and dilution, therefore, work in opposite directions, making the effect of team size on the donation term of the incentive constraint—and thus on the multiplier—ambiguous.

6 Extensions

The baseline model abstracts from several features of corporate giving that we explore next.

6.1 Employee Donations

Even though firms have technological advantages in some forms of giving, employees may still be able to supplement their employers' cash donations with their own. To examine how such opportunities affect the optimal contract, we extend the model to allow agents to add to the principal's donation.

After the principal pays wages $\boldsymbol{w}$ and makes donation G, each agent i makes donation g_i to solve

$$\max_{g_i \in [0, w_i]} u\big(w_i - g_i,\ G + \textstyle\sum_j g_j\big).$$

This setup nests the decentralized-donation benchmark from the previous section, in which $G = 0$, $\boldsymbol{w} = \boldsymbol{w}^* + \boldsymbol{d}$, and $\sum_i d_i = G^*$.

The next lemma follows directly from Bergstrom, Blume, and Varian (1986) and shows that agents donate any wages that exceed a wage threshold.

Lemma 1. *Given $(\boldsymbol{w}, G)$, the employee-donation game has a unique Nash equilibrium $\boldsymbol{g}$. If $\boldsymbol{w} = \boldsymbol{0}$, no agent tops up, $\boldsymbol{g} = \boldsymbol{0}$. Otherwise, agent i donates $g_i = (w_i - \bar{w})^+$, where $\bar{w} > 0$ solves $u_w(\bar{w}, G^{\mathrm{f}}) = u_G(\bar{w}, G^{\mathrm{f}})$ and G^{f} denotes the final donation $G^{\mathrm{f}} = G + \sum_i g_i$. If no agent donates, the threshold representation is not unique but any threshold $\tilde{w} \geq \max_i w_i$ generates the same equilibrium actions.*

The principal cares only about the final allocation $(\boldsymbol{w}^{\mathrm{f}}, G^{\mathrm{f}})$, where $w_i^{\mathrm{f}} := w_i - g_i$ and $G^{\mathrm{f}} := G + \sum_i g_i$, and can implement any such allocation by imposing a no-topping-up constraint $w_i \leq \overline{w}(G)$ for each agent i. These constraints ensure, without loss, that agents do not donate on their own.

Proposition 7. *Suppose utility is separable. Then a positive team score implies a positive donation: if $\sum_i \ell_i > 0$, then $G^* > 0$. Moreover, there exist score vectors $\boldsymbol{\ell}$ such that $G^* > 0$ even though $\sum_i \ell_i < 0$. In addition, for each agent i, $w_i^* > 0$ if and only if both $G^* > 0$ and $\ell_i > 0$. Finally, for any agent k with maximal score, the wage hits the cap, $w_k^* = \overline{w}(G^*)$, if and only if his peer score is nonpositive, $\sum_{j \neq k} \ell_j \leq 0$.*

Employee donations therefore tie wages to donations: rewarding individual performance with wages requires making a donation as well. Donations are made even when team performance alone does not justify them, and the wages of top performers in poorly performing teams are capped to prevent them from redirecting pay into donations that reward their peers. Employee donations thus broaden the use of donations while compressing wages.

6.2 Donating through Distortions

Donations are not the only way firms can support the causes their employees care about. Firms create externalities by generating consumer surplus, supplier and employee rents, pollution, and the like. If employees care about these external effects, they become a public good, or public bad, to which the firm can contribute by distorting production decisions. It may pay above-market prices to benefit suppliers, for instance, or overinvest in pollution abatement. Allowing for distortions captures such practices and also broadens the interpretation of purpose beyond altruism to mission.

To allow for distortions, we extend the baseline model by letting the principal contract not only over wages, but also over production decisions. We do not model these decisions explicitly. Instead, as in the baseline model, the parties contract over a scalar G that enters agents' utility. Its cost, though, is now given by $c(G, y)$, which may depend on realized output y and is minimized at the gross profit-maximizing benchmark $\bar{G}(y) > 0$. We assume that $c(\cdot, y)$ is differentiable and convex, with $c_G(G, y) < 0$ for $G < \bar{G}(y)$ and $c_G(G, y) > 0$ for $G > \bar{G}(y)$.

If employees care about consumer surplus, for instance, $\bar{G}(y)$ corresponds to the consumer surplus generated by profit-maximizing prices. Lowering prices below the profit-maximizing level increases both G and c, while raising prices lowers G but still increases c.

The next proposition characterizes the optimal contract.

Proposition 8. *Suppose utility is separable. The optimal contract* $(\boldsymbol{w}^*, G^*)$ *satisfies the sign tests* $w_i^* > 0 \iff \ell_i > 0$,

$$G^* \geq \bar{G}(y) \iff \sum_j \ell_j \, u_G(w_j^*, G^*) \geq 0, \qquad \text{and} \qquad G^* \leq \bar{G}(y) \iff \sum_j \ell_j \, u_G(w_j^*, G^*) \leq 0.$$

Moreover, whenever $w_i^* > 0$ *we have* $\lambda \, \ell_i \, u_w(w_i^*, G^*) = 1$, *and whenever* $G^* > 0$ *we have* $\lambda \sum_j \ell_j \, u_G(w_j^*, G^*) = c_G(G^*, y)$.

The main difference relative to the optimal contract in the baseline model is that distortions can serve as punishments as well as rewards. The relevant reference point is the benchmark $\bar{G}(y)$, not zero: the principal rewards good team performance by increasing G above $\bar{G}(y)$, but punishes poor team performance by reducing G below $\bar{G}(y)$. Allowing for distortions thus relaxes the non-negativity constraint, enabling the principal to make the equivalent of negative donations.

In practice, such punishments appear to be rare. TOMS, Patagonia, and Warby Parker do not respond to poor performance by exacerbating poverty, increasing pollution, or harming vision care. Reputational costs are a possible explanation. Evidence suggests that employees are more responsive to prosocial incentives when they are perceived as reflecting genuine concern for the underlying cause (Cassar and Meier 2018, 2021). Actions that contradict the firm's stated purpose risk revealing such incentives to be purely instrumental, thereby undermining their motivational effect.

Such reputational costs are nested in our formulation. If contributing below the benchmark is prohibitively costly—if $c_G(G, y) = -\infty$ for $G \leq \bar{G}(y)$—the optimal contract never prescribes $G < \bar{G}(y)$. Distortions can then be used only as rewards, not as punishments, and operate just like donations.

6.3 Preference Heterogeneity

The effectiveness of donations depends on the heterogeneity of employees' preferences and on the firm's ability to observe them. Suppose there are $k \geq 1$ distinct causes to which the principal can donate separately and each agent values donations to only one of them.

The next proposition shows that if the principal cannot observe which cause individual employees support, she is better off with a more homogeneous workforce.

Proposition 9. *Suppose utility is separable and that the principal cannot observe which cause each employee supports. Then, under the optimal contract* $(\boldsymbol{w}^*, G^*)$*, expected profits are decreasing in the number of causes* k*.*

Heterogeneity hurts profits because it limits scale. Since the principal cannot condition donations on individual causes, she supports all causes equally. As a result, the degree of heterogeneity k enters the principal's problem only by increasing the marginal cost of the donation from one to k, leaving the incentive and non-negativity constraints unchanged.

Information strengthens the case for heterogeneity. If the principal can observe employees' preferences, heterogeneity limits not only scale but also leakage. Donations to a subgroup's favored cause do not spill over to agents in other groups, whether deserving or undeserving. As a result, the effect of heterogeneity on profits is generally ambiguous, and an interior degree of heterogeneity, $k > 1$, may be optimal.

6.4 Participation Constraints

Finally, we augment the baseline model by adding participation constraints for the agents:

$$\mathbb{E}[u(w_i, G)] \geq \bar{u} \text{ for each } i,$$

where we have maintained our symmetry assumption. Upon assigning a common multiplier $\gamma \geq 0$ to these constraints, the Lagrangian is like the original one but with the additional term $n\gamma(\mathbb{E}[u(w_i, G)] - \bar{u})$.

Now define *augmented scores* $\tilde{\ell}_i := \ell_i + \gamma/\lambda$. The optimality conditions are then identical to those in the baseline model once each ℓ_i is replaced by $\tilde{\ell}_i$. As a result, both donations and wages are shifted upward relative to the baseline, but the results are qualitatively unchanged.

7 Conclusion

This paper examines why and how a profit-maximizing firm should combine pay with purpose to motivate employees. The key difference between the two instruments is that donations are a public good. Non-rivalry creates scale, but non-excludability creates leakage: donations reward all high-performing employees at once but also spill over to low performers. As a result, donations reward team performance and complement wages, which target individual performance.

Donations are used more sparingly than wages and require less information, often depending only on a summary measure of team performance. They are particularly effective in collaborative environments in which individual contributions are difficult to disentangle and performance signals are highly correlated. From a normative perspective, the firm's donation is conditionally Pareto efficient: when all employees perform well, the firm rewards them without distortion, but when some perform poorly, it reduces the donation to limit leakage, even below what employees would give on their own.

Taken together, our results suggest that firm-funded donations are not mere corporate philanthropy layered on top of incentives. They are an integral, public component of the compensation contract: generous when many deserve a reward, disciplined when they do not, and deliberately simple in the information they require.

The broader contribution of the paper is to study public rewards in agency problems. Public rewards abound. Even firms without a prosocial purpose or inspiring mission routinely reward collective performance with public goods such as shared experiences and investments in amenities. Public recognition likewise becomes a public good when bestowed at the group level. In the military, for instance, honors recognize unit performance through citations and other collective decorations, rewarding all unit members regardless of individual performance. In all these settings, public rewards face the same tradeoff as in this paper: they scale naturally across individuals but inevitably leak, while private rewards limit leakage at the cost of reach.

These applications raise new questions about the use of public rewards, such as the choice of purpose and its role in worker selection and labor-market competition. We leave these and related issues for future research.

8 Appendix

Proof of Proposition 1. Fix a state $(y, \boldsymbol{s})$ with $M^*(y, \boldsymbol{s}) > 0$ and let $M := M^*(y, \boldsymbol{s})$ and $\ell_i := \ell_i(y, \boldsymbol{s} \mid \boldsymbol{a})$. The only role of the split $(\boldsymbol{w}, G)$ is through the incentive-slack term $\sum_i \ell_i u(w_i, G)$. Hence, $(\boldsymbol{w}^*, G^*)$ must solve (5).

Step 1: Agents with non-positive scores receive zero wage. Let i be such that $\ell_i \leq 0$. Because $M > 0$, there must exist at least one agent j with $\ell_j > 0$ (otherwise every dollar spent weakly *reduces* $\sum_i \ell_i u(w_i, G)$, so the principal would never choose $M > 0$ in this state). If $w_i > 0$, then shifting a small amount $\varepsilon > 0$ from w_i to w_j strictly increases $\sum_k \ell_k u(w_k, G)$. Hence, in any maximizer of (5),

$$\ell_i \leq 0 \implies w_i^* = 0.$$

Step 2: If all scores are weakly positive, the split is Pareto efficient. Assume $\ell_i \geq 0$ for all i and let $(\boldsymbol{w}^*, G^*)$ solve (5) at outlay $M > 0$. Let $P := \{i : \ell_i > 0\}$ and $Z := \{i : \ell_i = 0\}$. Since $M > 0$, the set P is nonempty. By Step 1, $w_i^* = 0$ for all $i \in Z$. Moreover, because $\ell_i > 0$ for $i \in P$ and $\lim_{w \downarrow 0} u_w(w, G) = +\infty$, we must have $w_i^* > 0$ for every $i \in P$. Also, because some $\ell_i > 0$ and $\lim_{G \downarrow 0} u_G(w, G) = +\infty$, we must have $G^* > 0$.

Suppose toward a contradiction that $(\boldsymbol{w}^*, G^*)$ is not Pareto efficient. Then there exists a feasible $(\boldsymbol{w}', G')$ with $\sum_i w_i' + G' = M$ such that $u(w_i', G') \geq u(w_i^*, G^*)$ for all i, with strict inequality for some agent.

If the strict inequality holds for some $i \in P$ (i.e., with $\ell_i > 0$), then

$$\sum_i \ell_i \, u(w_i', G') \; > \; \sum_i \ell_i \, u(w_i^*, G^*),$$

contradicting optimality of $(\boldsymbol{w}^*, G^*)$ in (5). Hence the only remaining possibility is that all agents in P are exactly indifferent:

$$u(w_i', G') = u(w_i^*, G^*) \quad \text{for all } i \in P,$$

and the strict improvement occurs only for agents in Z.

To rule this out, fix the utility levels of the positively weighted agents, $U_i^* := u(w_i^*, G^*)$ for $i \in P$, and consider the *expenditure minimization* problem

$$\min_{\{w_i\}_{i \in P}, G \geq 0} \sum_{i \in P} w_i + G \quad \text{s.t.} \quad u(w_i, G) \geq U_i^* \;\; \forall i \in P, \quad w_i \geq 0. \tag{CM}$$

Because u is increasing, all constraints bind at a minimizer. Let τ denote the multiplier on $\sum_i w_i + G = M$ in (5). Since $w_i^* > 0$ for $i \in P$ and $G^* > 0$, the KKT conditions for (5) give

$$\ell_i\, u_w(w_i^*, G^*) = \tau \quad \forall i \in P, \qquad \sum_{i \in P} \ell_i\, u_G(w_i^*, G^*) = \tau.$$

Setting $\eta_i := \ell_i / \tau > 0$ yields

$$1 = \eta_i\, u_w(w_i^*, G^*) \quad \forall i \in P, \qquad 1 = \sum_{i \in P} \eta_i\, u_G(w_i^*, G^*),$$

which are exactly the KKT conditions for (CM). Since (CM) is a convex program (linear objective and convex upper contour sets), $(\{w_i^*\}_{i \in P}, G^*)$ is a unique minimizer. Therefore any allocation that gives each $i \in P$ utility at least U_i^* must satisfy

$$\sum_{i \in P} w_i + G \;\geq\; \sum_{i \in P} w_i^* + G^* \;=\; M.$$

Apply this to $(\boldsymbol{w}', G')$. Because $u(w_i', G') \geq U_i^*$ for all $i \in P$, we have $\sum_{i \in P} w_i' + G' \geq M$. But feasibility requires

$$M = \sum_i w_i' + G' = \Big(\sum_{i \in P} w_i' + G' \Big) + \sum_{i \in Z} w_i',$$

and $w_i' \geq 0$. Hence we must have $\sum_{i \in Z} w_i' = 0$ and $\sum_{i \in P} w_i' + G' = M$. By uniqueness of the minimizer of (CM), this requires $(\{w_i'\}_{i \in P}, G') = (\{w_i^*\}_{i \in P}, G^*)$, so agents in Z face the same (w_i, G) as under $(\boldsymbol{w}^*, G^*)$ and cannot be strictly better off. This contradiction establishes that $(\boldsymbol{w}^*, G^*)$ is Pareto efficient.

Step 3: If some score is strictly negative, the split is not Pareto efficient. Assume there exists k with $\ell_k < 0$. Then Step 1 gives $w_k^* = 0$. Let $P := \{i : \ell_i > 0\}$ and $B := \{i : \ell_i \leq 0\}$; both sets are nonempty because $M > 0$ and some $\ell_k < 0$. Step 1 implies $w_i^* = 0$ for all $i \in B$, and by Inada at $w \downarrow 0$ we have $w_i^* > 0$ for all $i \in P$.

We show that $(\boldsymbol{w}^*, G^*)$ is Pareto dominated by a nearby feasible allocation.

Case 1: $G^* = 0$. Since $M > 0$ and $P \neq \emptyset$, pick any $i \in P$ so that $w_i^* > 0$. By the Inada condition $\lim_{G \downarrow 0} u_G(w, G) = +\infty$, for sufficiently small $\varepsilon > 0$ we have

$$u(w_i^* - \varepsilon, \varepsilon) > u(w_i^*, 0).$$

Define $G' = \varepsilon$, $w_i' = w_i^* - \varepsilon$, and $w_j' = w_j^*$ for $j \neq i$. Then the budget $\sum_j w_j' + G' = M$ holds. Agent i is strictly better off, while every other agent is weakly better off because G increases and wages weakly increase (they are unchanged). Hence $(\boldsymbol{w}^*, 0)$ is not Pareto efficient.

Case 2: $G^* > 0$. Let τ be the multiplier on the budget constraint in (5). The KKT conditions give

$$\ell_i \, u_w(w_i^*, G^*) = \tau \qquad \forall i \in P, \qquad \text{and} \qquad \sum_j \ell_j \, u_G(w_j^*, G^*) = \tau.$$

Because $w_j^* = 0$ for $j \in B$ and $\ell_j \le 0$, we have $\ell_j u_G(w_j^*, G^*) = \ell_j u_G(0, G^*) \le 0$, with strict inequality for $j \in N := \{j : \ell_j < 0\} \neq \emptyset$. Therefore

$$\sum_{i \in P} \ell_i \, u_G(w_i^*, G^*) = \tau - \sum_{j \in B} \ell_j \, u_G(0, G^*) > \tau.$$

Divide by $\tau > 0$ and use $\tau = \ell_i u_w(w_i^*, G^*)$ for $i \in P$ to obtain

$$S \;:=\; \sum_{i \in P} \frac{u_G(w_i^*, G^*)}{u_w(w_i^*, G^*)} \;>\; 1.$$

Now fix $\varepsilon > 0$ and define a feasible perturbation that increases G by ε and reduces wages of agents in P proportionally:

$$G' := G^* + \varepsilon, \qquad w_i' := w_i^* - \frac{1}{S} \frac{u_G(w_i^*, G^*)}{u_w(w_i^*, G^*)} \varepsilon \;\text{ for } i \in P, \qquad w_j' := w_j^* = 0 \;\text{ for } j \in B.$$

Feasibility holds because

$$\sum_{i \in P} (w_i^* - w_i') = \frac{1}{S} \sum_{i \in P} \frac{u_G(w_i^*, G^*)}{u_w(w_i^*, G^*)} \varepsilon = \varepsilon,$$

so $\sum_i w_i' + G' = \sum_i w_i^* + G^* = M$. For ε small enough, all w_i' remain nonnegative.

Consider any $i \in P$. By differentiability, the directional derivative of $u(w_i', G')$ at $\varepsilon = 0$ is

$$\frac{d}{d\varepsilon} u(w_i', G') \bigg|_{\varepsilon = 0} = -u_w(w_i^*, G^*) \cdot \frac{1}{S} \frac{u_G(w_i^*, G^*)}{u_w(w_i^*, G^*)} + u_G(w_i^*, G^*) = u_G(w_i^*, G^*) \Big(1 - \frac{1}{S}\Big) > 0,$$

since $S > 1$. Hence for all sufficiently small $\varepsilon > 0$ we have $u(w_i', G') > u(w_i^*, G^*)$ for every $i \in P$. For any $j \in B$, wages are unchanged at 0 and G strictly increases, so $u(w_j', G') = u(0, G^* + \varepsilon) > u(0, G^*) = u(w_j^*, G^*)$.

Thus $(\boldsymbol{w}', G')$ is a Pareto improvement over $(\boldsymbol{w}^*, G^*)$, and the latter is not Pareto efficient.

Steps 2 and 3 together establish that the split is Pareto efficient iff all scores are weakly positive. ☐

Proof of Proposition 2. We prove the proposition by example.

Step 1: A state in which $G^{**} < G^{*}$ for some distribution $\boldsymbol{d}$. Suppose all scores are identical and strictly positive:

$$\ell_1 = \cdots = \ell_n = \ell > 0.$$

By symmetry of the split problem, the principal's optimal allocation is symmetric:

$$w_1^* = \cdots = w_n^* =: w^*.$$

Because all scores are positive and $M^* > 0$, we also have $G^* > 0$.

Now choose the distribution $\boldsymbol{d}$ that splits the foregone firm donation equally across agents:

$$d_i = \frac{G^*}{n} \qquad \text{for all } i.$$

Then the decentralized donation game is symmetric, so by uniqueness of equilibrium (see Lemma 1) the equilibrium donation profile is symmetric as well:

$$g_i = \frac{G^{**}}{n} \qquad \text{for all } i.$$

Suppose toward a contradiction that $G^{**} \geq G^*$. Then each agent's final allocation is

$$\left(w^* - \delta,\ G^* + n\delta\right), \qquad \delta := \frac{G^{**} - G^*}{n} \geq 0.$$

Since $G^* > 0$, each agent contributes strictly positively, so the private first-order condition gives

$$u_w(w^* - \delta, G^* + n\delta) = u_G(w^* - \delta, G^* + n\delta).$$

Now define

$$\phi(\delta) := u(w^* - \delta, G^* + n\delta).$$

Because u is concave, ϕ is concave. At $\delta = 0$, the principal's first-order conditions imply

$$u_w(w^*, G^*) = n\, u_G(w^*, G^*),$$

so

$$\phi'(0) = -u_w(w^*, G^*) + n\, u_G(w^*, G^*) = 0.$$

Concavity therefore implies $\phi'(\delta) \leq 0$ for all $\delta \geq 0$, i.e.

$$u_w(w^* - \delta, G^* + n\delta) \geq n\, u_G(w^* - \delta, G^* + n\delta) > u_G(w^* - \delta, G^* + n\delta),$$

a contradiction. Hence $G^{**} < G^{*}$.

Step 2: A state in which $G^{**} > G^{*}$ for some distribution $\boldsymbol{d}$. Now suppose one agent, say agent m, has a strictly positive score and all others have strictly negative scores:

$$\ell_m > 0, \qquad \ell_j < 0 \quad \text{for all } j \neq m.$$

Choose the distribution $\boldsymbol{d}$ that assigns the entire foregone firm donation to agent m:

$$d_m = G^{*}, \qquad d_j = 0 \quad \text{for } j \neq m.$$

Suppose toward a contradiction that $G^{**} \leq G^{*}$. Then

$$w_m^{*} + G^{*} - g_m \geq w_m^{*}.$$

Also, every agent with a negative score receives zero wage in the principal's allocation, so

$$w_j^{*} = 0 \qquad \text{for all } j \neq m.$$

If $g_m = 0$, then $G^{**} = 0$, which is impossible by Inada, since agent m would strictly prefer to make a positive donation. Thus $g_m > 0$, and the private first-order condition for agent m gives

$$u_w(w_m^{*} + G^{*} - g_m, G^{**}) = u_G(w_m^{*} + G^{*} - g_m, G^{**}).$$

By the principal's first-order conditions,

$$\ell_m u_w(w_m^{*}, G^{*}) = \ell_m u_G(w_m^{*}, G^{*}) + \sum_{j \neq m} \ell_j u_G(0, G^{*}).$$

Since $\ell_j < 0$ and $u_G(0, G^{*}) > 0$ for all $j \neq m$, the last term is strictly negative. Hence

$$u_w(w_m^{*}, G^{*}) < u_G(w_m^{*}, G^{*}).$$

Under the hypothesis $G^{**} \leq G^{*}$, agent m has weakly more private consumption and weakly less public good than at (w_m^{*}, G^{*}), so the same strict inequality holds at

$$(w_m^{*} + G^{*} - g_m, G^{**}),$$

contradicting the private first-order condition. Therefore $G^{**} > G^{*}$. $\square$

Proof of Proposition 3. Fix a realization $(y, \boldsymbol{s})$ and let $\boldsymbol{\ell} = (\ell_1, \ldots, \ell_n)$ denote the associated score vector. Given the common multiplier $\lambda > 0$, the Lagrangian (4) implies that the principal's choice of $(\boldsymbol{w}(y, \boldsymbol{s}), G(y, \boldsymbol{s}))$ is statewise: in each state she solves

$$\max_{\boldsymbol{w} \geq 0,\, G \geq 0} \; \Phi(\boldsymbol{w}, G; \boldsymbol{\ell}) := -\Big(\sum_i w_i + G\Big) \; + \; \lambda \sum_i \ell_i \, u(w_i, G). \tag{9}$$

Let $(\boldsymbol{w}^*, G^*)$ be an optimizer of (9) for the given $\boldsymbol{\ell}$.

Step 1: Wage sign test and interior wage condition. Fix $G \geq 0$ and consider agent i's wage term in (9):

$$\phi_i(w; G) := -w + \lambda \, \ell_i \, u(w, G), \qquad w \geq 0.$$

Since $u_w(w, G) > 0$, if $\ell_i \leq 0$ then $\phi_i'(w; G) = -1 + \lambda \ell_i u_w(w, G) \leq -1 < 0$, so $\phi_i(\cdot; G)$ is strictly decreasing and the unique maximizer is $w_i^* = 0$.

If instead $\ell_i > 0$, then by Inada at $w \downarrow 0$ we have $\lim_{w \downarrow 0} \phi_i'(w; G) = +\infty$, while $\lim_{w \to \infty} \phi_i'(w; G) = -1$ by $\lim_{w \to \infty} u_w(w, G) = 0$. Hence the maximizer satisfies $w_i^* > 0$ and the first-order condition

$$-1 + \lambda \, \ell_i \, u_w(w_i^*, G) = 0 \quad \Longleftrightarrow \quad \lambda \, \ell_i \, u_w(w_i^*, G) = 1.$$

This establishes

$$w_i^* > 0 \iff \ell_i > 0, \qquad \text{and whenever } w_i^* > 0: \;\; \lambda \, \ell_i \, u_w(w_i^*, G^*) = 1.$$

Step 2: Donation KKT conditions. Let $\nu^* \geq 0$ be the multiplier on $G \geq 0$. Optimality in G yields

$$-1 + \lambda \sum_i \ell_i \, u_G(w_i^*, G^*) + \nu^* = 0, \qquad \nu^* G^* = 0. \tag{10}$$

In particular, whenever $G^* > 0$ we have $\nu^* = 0$ and therefore

$$\lambda \sum_i \ell_i \, u_G(w_i^*, G^*) = 1.$$

It remains to prove the sign tests for G^*.

Step 3: $\sum_i \ell_i > 0$ implies $G^* > 0$ for any sign of u_{wG}. Assume $\sum_i \ell_i > 0$ and suppose toward a contradiction that $G^* = 0$. By Step 1, $w_i^* = 0$ if $\ell_i \leq 0$ and $w_i^* > 0$ if $\ell_i > 0$. Define

$$W := \max_{i:\, \ell_i > 0} w_i^* \in (0, \infty).$$

Finiteness follows because $u_w(\cdot, 0)$ is strictly decreasing with limit 0 at ∞ and $\lambda \ell_i u_w(w_i^*, 0) = 1$ for each $\ell_i > 0$.

By the maintained bounded-cross-partial assumption, there exist $\bar{G} > 0$ and $L < \infty$ such that

$$|u_{wG}(w, G)| \leq L \qquad \text{for all } w \in [0, W] \;\text{ and }\; G \in (0, \bar{G}].$$

Hence for every i with $\ell_i > 0$ and every $G \in (0, \bar{G}]$,

$$u_G(w_i^*, G) - u_G(0, G) = \int_0^{w_i^*} u_{wG}(x, G)\, dx \;\geq\; -Lw_i^*,$$

so

$$u_G(w_i^*, G) \;\geq\; u_G(0, G) - Lw_i^*.$$

For $\ell_i \leq 0$, Step 1 gives $w_i^* = 0$ and thus $u_G(w_i^*, G) = u_G(0, G)$. Therefore, for $G \in (0, \bar{G}]$,

$$\begin{aligned}\sum_i \ell_i\, u_G(w_i^*, G) &= \sum_i \ell_i\, u_G(0, G) \;+ \sum_{i:\ell_i>0} \ell_i\big(u_G(w_i^*, G) - u_G(0, G)\big) \\ &\geq \sum_i \ell_i\, u_G(0, G) \;-\; L \sum_{i:\ell_i>0} \ell_i w_i^*.\end{aligned}$$

The second term on the right is finite and independent of G, while by Inada in G we have $u_G(0, G) \to +\infty$ as $G \downarrow 0$. Since $\sum_i \ell_i > 0$, we can choose $\varepsilon \in (0, \bar{G}]$ small enough that

$$-1 + \lambda \sum_i \ell_i\, u_G(w_i^*, \varepsilon) \;>\; 0.$$

But then increasing G from 0 to ε while holding $\boldsymbol{w} = \boldsymbol{w}^*$ fixed strictly raises the objective (9), contradicting optimality of $(\boldsymbol{w}^*, 0)$. Hence $G^* > 0$ whenever $\sum_i \ell_i > 0$.

Step 4: If $u_{wG} \leq 0$, then $\sum_i \ell_i \leq 0$ implies $G^* = 0$. Assume $u_{wG} \leq 0$, so $u_G(\cdot, G)$ is weakly decreasing in w. Suppose $\sum_i \ell_i \leq 0$ and (toward a contradiction) $G^* > 0$. By Step 1, $w_i^* > 0$ iff $\ell_i > 0$. For $\ell_i > 0$, we have $u_G(w_i^*, G^*) \leq u_G(0, G^*)$; for $\ell_i \leq 0$, $w_i^* = 0$ so $u_G(w_i^*, G^*) = u_G(0, G^*)$. Hence

$$\sum_i \ell_i\, u_G(w_i^*, G^*) \;\leq\; \sum_i \ell_i\, u_G(0, G^*) \;\leq\; 0,$$

which contradicts the interior donation condition from Step 2, $\lambda \sum_i \ell_i u_G(w_i^*, G^*) = 1 > 0$. Therefore $G^* = 0$ whenever $\sum_i \ell_i \leq 0$ under $u_{wG} \leq 0$.

Combining Step 3 and Step 4 yields, when $u_{wG} \leq 0$,

$$G^* > 0 \iff \sum_i \ell_i > 0.$$

When $u_{wG} > 0$, Step 3 yields the stated one-way implication

$$G^* > 0 \Leftarrow \sum_i \ell_i > 0.$$

Together with Steps 1–2, this completes the proof. $\square$

Proof of Proposition 4. From equation (7), under separable utility the optimal donation depends on $(y, \boldsymbol{s})$ only through the team score $\sum_i \ell_i(y, \boldsymbol{s} \mid \boldsymbol{a})$. The donation KKT condition is therefore $\lambda(\sum_i \ell_i) r'(G^*) \leq 1$, with equality when $G^* > 0$. The condition in the proposition implies that $\sum_i \ell_i(y, \boldsymbol{s} \mid \boldsymbol{a})$ is a function of $(y, \boldsymbol{a})$ only, so G^* is a function of y only.

$\square$

Proof of Proposition 5. Correlation affects the principal's problem only through the incentive constraints: the objective and the pointwise optimality conditions are unchanged.

Under separability, the binding incentive constraint for any agent i can be written as

$$\mathbb{E}[\ell_i v(w_i^*)] + \frac{1}{n}\,\mathbb{E}\left[\sum_i \ell_i\, r(G^*)\right] = 1,$$

where we used symmetry to replace $\mathbb{E}[\ell_i r(G^*)]$ with $\frac{1}{n}\mathbb{E}[\sum_i \ell_i r(G^*)]$.

Because the wage term $\mathbb{E}[\ell_i v(w_i^*)]$ depends only on the marginal distribution of ℓ_i, an increase in correlation affects only the donation term $\mathbb{E}[\sum_i \ell_i r(G^*)]$. For fixed λ, the donation term $\sum_i \ell_i r(G^*)$ is a convex function of $\sum_i \ell_i$ under DARA with respect to the donation. Hence a mean–preserving spread of $\sum_i \ell_i$ raises $\mathbb{E}[\sum_i \ell_i r(G^*)]$ and relaxes the incentive constraint. The left-hand side of the incentive constraint is increasing in λ because, whenever $w_i^* > 0$ and $G^* > 0$, the first-order conditions imply that both w_i^* and G^* increase with λ. Restoring the binding constraint therefore requires a lower multiplier λ. $\square$

Proof of Proposition 6. It follows from Proposition 3 that, under the conditions of the proposition, we have

$$w_i^* = (\lambda \ell_i^+)^{1/\gamma_v} \qquad \text{and} \qquad G^* = (\alpha\lambda(\sum_i \ell_i)^+)^{1/\gamma_r}.$$

The donation–wage bill ratio is therefore given by

$$\frac{\mathbb{E}[G^*]}{\mathbb{E}[\sum_i w_i^*]} = \alpha^{1/\gamma_r}\,\lambda^{1/\gamma_r - 1/\gamma_v}\,\frac{\mathbb{E}\big[((\sum_i \ell_i)^+)^{1/\gamma_r}\big]}{\sum_i \mathbb{E}\big[(\ell_i^+)^{1/\gamma_v}\big]}.$$

CRRA implies decreasing absolute risk aversion with respect to the donation. It then follows from Proposition 5 that an increase in correlation lowers λ. Since $\gamma_v \leq \gamma_r$, a reduction in λ raises the factor $\lambda^{1/\gamma_r - 1/\gamma_v}$.

Because an increase in correlation leaves the marginal distributions of the ℓ_i unchanged, it does not affect the denominator $\sum_i \mathbb{E}\big[(\ell_i^+)^{1/\gamma_v}\big]$. It does, however, generate a mean–preserving spread of $\sum_i \ell_i$. Since $\gamma_r \leq 1$, this spread raises the numerator $\mathbb{E}[((\sum_i \ell_i)^+)^{1/\gamma_r}]$. Combining this with the effect through λ yields the result. □

Proof of Proposition 7. Fix a realization $(y, \boldsymbol{s})$. The principal chooses the final allocation $(\boldsymbol{w}, G)$ subject to

$$0 \leq w_i \leq \overline{w}(G), \qquad G \geq 0,$$

where, for $G > 0$, $\overline{w}(G)$ is defined by

$$v'(\overline{w}(G)) = r'(G).$$

By Inada, $\overline{w}(G) \downarrow 0$ as $G \downarrow 0$, so we may define $\overline{w}(0) = 0$. The pointwise problem is therefore

$$\max_{\boldsymbol{w}, G}\; -\sum_i w_i - G + \lambda \sum_i \ell_i\big(v(w_i) - v(0) + r(G) - r(0)\big)$$

subject to $w_i \geq 0$, $G \geq 0$, and $w_i \leq \overline{w}(G)$ for each i, with respective multipliers μ_i, ν, and $\kappa_i \geq 0$. The KKT conditions are

$$-1 + \lambda \ell_i v'(w_i) + \mu_i - \kappa_i = 0 \qquad \text{for each } i,$$

$$-1 + \lambda\Big(\sum_j \ell_j\Big) r'(G) + \nu + \overline{w}'(G)\sum_j \kappa_j = 0,$$

together with complementary slackness, $\mu_i w_i = 0$, $\nu G = 0$, and $\kappa_i\big(\overline{w}(G) - w_i\big) = 0$ for each i.

For a given G, wage choices are independent across agents. If $\ell_i \leq 0$, then $-w + \lambda \ell_i v(w)$ is decreasing in w, so agent i receives zero wage. For $x \geq 0$, define

$$b(x, G) := \max_{0 \leq w \leq \overline{w}(G)} \{-w + \lambda x\,[v(w) - v(0)]\}.$$

Because $w = 0$ is feasible, $b(x, G) \geq 0$, and $b(x, 0) = 0$ for every $x \geq 0$.

The principal's problem therefore reduces to

$$\max_{G\geq 0} \; -G+\lambda\Big(\sum_i \ell_i\Big)[r(G)-r(0)]+\sum_i b(\ell_i^+,G),$$

where $\ell_i^+ := \max\{\ell_i, 0\}$.

Step 1: Donation. The principal's problem reduces to

$$\max_{G\geq 0} \; -G+\lambda\Big(\sum_i \ell_i\Big)[r(G)-r(0)]+\sum_i b(\ell_i^+,G),$$

where $\ell_i^+ := \max\{\ell_i, 0\}$ and

$$b(x,G) := \max_{0\leq w\leq \overline{w}(G)} \{-w+\lambda x[v(w)-v(0)]\}.$$

Because $w=0$ is feasible, $b(x,G)\geq 0$ for all x, G, and $b(x,0)=0$.

If $\sum_i \ell_i > 0$, then

$$-G+\lambda\Big(\sum_i \ell_i\Big)[r(G)-r(0)]+\sum_i b(\ell_i^+,G) \;\geq\; -G+\lambda\Big(\sum_i \ell_i\Big)[r(G)-r(0)].$$

By the Inada condition at $G\downarrow 0$, the right-hand side is positive for all sufficiently small $G>0$. Since the payoff at $G=0$ is 0, it follows that $G^*>0$.

To see that $G^*>0$ may also occur when $\sum_i \ell_i < 0$, fix any $G_0>0$. Since $\overline{w}(G_0)>0$, for every $x>0$,

$$b(x,G_0)\geq -\overline{w}(G_0)+\lambda x\big(v(\overline{w}(G_0))-v(0)\big).$$

The right-hand side tends to $+\infty$ as $x\to\infty$. Hence we can choose $x>0$ large enough and then $\varepsilon>0$ small enough that, for

$$\boldsymbol{\ell}=(x,-x-\varepsilon,0,\ldots,0),$$

we have $\sum_i \ell_i = -\varepsilon < 0$ and

$$-G_0-\lambda\varepsilon[r(G_0)-r(0)]+b(x,G_0)>0.$$

For this score vector, the reduced objective is therefore strictly positive at G_0, while it is 0 at $G=0$. Hence $G^*>0$.

Step 2: Wage sign test. If $G^*=0$, then $\overline{w}(0)=0$, so $w_i^*=0$ for every i.

If $G^*>0$, wage choices are independent across agents. As noted above, $w_i^*=0$ whenever

$\ell_i \le 0$. If $\ell_i > 0$, then w_i^* solves

$$\max_{0 \le w \le \overline{w}(G^*)} \{-w + \lambda \ell_i v(w)\}.$$

By Inada,

$$\lim_{w \downarrow 0} \bigl(-1 + \lambda \ell_i v'(w)\bigr) = +\infty,$$

so the maximizer is strictly positive. Therefore

$$w_i^* > 0 \iff G^* > 0 \text{ and } \ell_i > 0.$$

Step 3: Binding wage cap. Let $k \in \arg\max_i \ell_i$. Suppose first that $G^* > 0$.

We begin by characterizing which agents hit the cap. For each agent with $\ell_i > 0$, let

$$\widehat{w}_i := (v')^{-1}\left(\frac{1}{\lambda \ell_i}\right)$$

denote the unconstrained wage. Since $v'(\overline{w}(G^*)) = r'(G^*)$, if we define

$$c := \frac{1}{\lambda r'(G^*)},$$

then

$$w_i^* = \overline{w}(G^*) \iff \widehat{w}_i \ge \overline{w}(G^*) \iff \ell_i \ge c.$$

Thus an agent hits the cap if and only if his score is at least the cutoff c. Likewise, the cap binds strictly for agent i if and only if $\kappa_i > 0$, or equivalently $\ell_i > c$.

Next we relate this cutoff to the team score. If $w_i^* = \overline{w}(G^*)$, then $v'(w_i^*) = r'(G^*)$, so the wage KKT condition gives

$$\kappa_i = \lambda \ell_i r'(G^*) - 1.$$

Hence

$$\kappa_i = (\lambda \ell_i r'(G^*) - 1)^+.$$

Since $G^* > 0$, complementary slackness gives $\nu = 0$, so the donation KKT condition becomes

$$-1 + \lambda \Bigl(\sum_j \ell_j\Bigr) r'(G^*) + \overline{w}'(G^*) \sum_j \kappa_j = 0.$$

Multiplying by c therefore yields

$$c = \sum_j \ell_j + \overline{w}'(G^*) \sum_j (\ell_j - c)^+,$$

and hence $c \geq \sum_j \ell_j$.

We can now prove the cap statement in the proposition for the case $G^* > 0$. Suppose first that $w_k^* = \overline{w}(G^*)$. Then

$$\ell_k \geq c \geq \sum_j \ell_j.$$

Therefore

$$\sum_{j \neq k} \ell_j = \sum_j \ell_j - \ell_k \leq 0.$$

Conversely, suppose $\sum_{j \neq k} \ell_j \leq 0$, so that $\ell_k \geq \sum_j \ell_j$. If $w_k^* < \overline{w}(G^*)$, then $\ell_k < c$. Since k has the highest score, this implies $\ell_i < c$ for every i, so the positive-part term in the last display would vanish and we would have $c = \sum_j \ell_j$. But then $\ell_k \geq \sum_j \ell_j = c$, contradicting $\ell_k < c$. Hence $w_k^* = \overline{w}(G^*)$. This proves the cap statement whenever $G^* > 0$.

If instead $G^* = 0$, then $\overline{w}(G^*) = \overline{w}(0) = 0$, so $w_k^* = \overline{w}(G^*)$. It remains to show that $\sum_{j \neq k} \ell_j \leq 0$. Suppose not. Then $\sum_{j \neq k} \ell_j > 0$. Hence some peer has strictly positive score, and since k has the highest score, $\ell_k > 0$ as well. Therefore

$$\sum_j \ell_j = \ell_k + \sum_{j \neq k} \ell_j > 0.$$

By Step 1 this implies $G^* > 0$, a contradiction. Therefore $\sum_{j \neq k} \ell_j \leq 0$.

□

Proof of Proposition 8. Fix a realization $(y, \boldsymbol{s})$. Relative to Proposition 3, the pointwise problem differs only in that the donation enters profits through the cost function $c(G, y)$ rather than linearly.

The wage KKT condition is unchanged. By the same argument as in Proposition 3, an agent receives a positive wage if and only if his score is positive, and whenever the wage is positive it satisfies the corresponding interior condition.

Consider the donation. When $G^* > 0$, complementary slackness implies that the nonnegativity constraint does not bind, and the first-order condition equates the score-weighted marginal utility of the donation to its marginal cost $c_G(G^*, y)$. Since $c(\cdot, y)$ is convex and minimized at $\bar{G}(y)$, we have $c_G(G, y) \geq 0$ if and only if $G \geq \bar{G}(y)$, and $c_G(G, y) \leq 0$ if and only if $G \leq \bar{G}(y)$. The sign of the weighted team score therefore determines whether the optimal donation lies above or below the benchmark.

If $G^* = 0$, then $G^* \le \bar{G}(y)$ automatically, and the KKT conditions imply that the weighted team score is weakly negative, consistent with the sign test. $\square$

Proof of Proposition 9. Fix wages $\boldsymbol{w}$. Let $\boldsymbol{\ell} = (\ell_1, \ldots, \ell_n)$ denote the score vector and let $G^*(\boldsymbol{\ell} \mid \boldsymbol{w})$ denote an optimal donation rule given wages in the problem with a single cause:

$$\min_{G(\cdot)\ge 0} \mathbb{E}[G(\boldsymbol{\ell})] \quad \text{s.t.} \quad \mathbb{E}[\ell_i \, u(w_i(\boldsymbol{\ell}), G(\boldsymbol{\ell}))] \ge 1 \text{ for all } i.$$

Next consider the k-cause extension and let $(G_1(\boldsymbol{\ell} \mid \boldsymbol{w}), \ldots, G_k(\boldsymbol{\ell} \mid \boldsymbol{w}))$ denote any feasible donation vector. Because the principal cannot observe causes, the relaxed incentive constraint must hold for each agent under each cause. Hence, for every m,

$$\mathbb{E}[\ell_i \, u(w_i(\boldsymbol{\ell}), G_m(\boldsymbol{\ell} \mid \boldsymbol{w}))] \ge 1 \quad \text{for all } i.$$

Each $G_m(\boldsymbol{\ell} \mid \boldsymbol{w})$ is therefore feasible in the problem with a single cause, so that

$$\mathbb{E}[G_m(\boldsymbol{\ell} \mid \boldsymbol{w})] \ge \mathbb{E}[G^*(\boldsymbol{\ell} \mid \boldsymbol{w})] \quad \text{for each } m.$$

Summing over causes gives

$$\sum_{m=1}^{k} \mathbb{E}[G_m(\boldsymbol{\ell} \mid \boldsymbol{w})] \;\ge\; k \, \mathbb{E}[G^*(\boldsymbol{\ell} \mid \boldsymbol{w})].$$

Conversely, setting $G_1 = \cdots = G_k \equiv G^*(\boldsymbol{\ell} \mid \boldsymbol{w})$ satisfies all constraints and attains equality. Therefore, conditional on wages $\boldsymbol{w}$, the minimum total expected donation cost is $k \, \mathbb{E}[G^*(\boldsymbol{\ell} \mid \boldsymbol{w})]$.

The principal's relaxed problem with k causes can therefore be written as

$$\Pi(k) = \max_{\boldsymbol{w}(\cdot)\ge 0} \left\{ \mathbb{E}\left[y - \sum_i w_i(\boldsymbol{\ell}) \right] - k \, \mathbb{E}[G^*(\boldsymbol{\ell} \mid \boldsymbol{w})] \right\},$$

which is weakly decreasing in k. $\square$

References

[1] Akerlof, George A., and Rachel E. Kranton. 2005. Identity and the Economics of Organizations. *Journal of Economic Perspectives* 19(1): 9–32.

[2] Ariely, Dan, Emir Kamenica, and Dražen Prelec. 2008. Man's Search for Meaning: The Case of Legos. *Journal of Economic Behavior & Organization* 67(3–4): 671–677.

[3] Ashraf, Nava, Oriana Bandiera, and B. Kelsey Jack. 2014. No Margin, No Mission? A Field Experiment on Incentives for Public Service Delivery. *Journal of Public Economics* 120: 1–17.

[4] Ashraf, Nava, Oriana Bandiera, Virginia Minni, and Luigi Zingales. 2025. Meaning at Work. Unpublished manuscript.

[5] Bergstrom, Theodore, Lawrence Blume, and Hal Varian. 1986. On the Private Provision of Public Goods. *Journal of Public Economics* 29(1): 25–49.

[6] Bénabou, Roland, and Jean Tirole. 2006. Incentives and Prosocial Behavior. *American Economic Review* 96(5): 1652–1678.

[7] Bénabou, Roland, and Jean Tirole. 2010. Individual and Corporate Social Responsibility. *Economica* 77(305): 1–19.

[8] Besley, Timothy, and Maitreesh Ghatak. 2005. Competition and Incentives with Motivated Agents. *American Economic Review* 95(3): 616–636.

[9] Besley, Timothy, and Maitreesh Ghatak. 2007. Retailing Public Goods: The Economics of Corporate Social Responsibility. *Journal of Public Economics* 91(9): 1645–1663.

[10] Bowles, Samuel, and Sandra Polánia-Reyes. 2012. Economic Incentives and Social Preferences: Substitutes or Complements? *Journal of Economic Literature* 50(2): 368–425.

[11] Cassar, Lea, and Stephan Meier. 2018. Nonmonetary Incentives and the Implications of Work as a Source of Meaning. *Journal of Economic Perspectives* 32(3): 215–238.

[12] Cassar, Lea, and Stephan Meier. 2021. Intentions for Doing Good Matter for Doing Well: The Negative Effects of Prosocial Incentives. *The Economic Journal* 131(637): 1988–2017.

[13] DellaVigna, Stefano, and Devin Pope. 2018. What Motivates Effort? Evidence and Expert Forecasts. *Review of Economic Studies* 85(2): 1029–1069.

[14] Feferman, Flavio, and Mike Grandinetti. 2022. *groupelephant.com 2021: Beyond Corporate Purpose*. Berkeley Haas Case Series, University of California, Berkeley.

[15] Friedman, Milton. 1970. The Social Responsibility of Business Is to Increase Its Profits. *New York Times Magazine*, September 13.

[16] Gartenberg, Claudine, Andrea Prat, and George Serafeim. 2019. Corporate Purpose and Financial Performance. *Organization Science* 30(1): 1–18.

[17] Georgiadis, George, and Michael Powell. 2022. A/B Contracts. *American Economic Review* 112(1): 267–303.

[18] Giving USA Foundation. 2025. *Giving USA 2025: The Annual Report on Philanthropy for the Year 2024*. Chicago.

[19] Gosnell, Greer K., John A. List, and Robert D. Metcalfe. 2020. The Impact of Management Practices on Employee Productivity: A Field Experiment with Airline Captains. *Journal of Political Economy* 128(4): 1195–1235.

[20] Green, Jerry, and Jean-Jacques Laffont. 1979. Incentives in Public Decision Making. Amsterdam: North-Holland.

[21] Groves, Theodore, and John Ledyard. 1977. Optimal Allocation of Public Goods: A Solution to the "Free Rider" Problem. *Econometrica* 45(4): 783–809.

[22] Henderson, Rebecca, and Eric Van den Steen. 2015. Why Do Firms Have "Purpose"? The Firm's Role as a Carrier of Identity and Reputation. *American Economic Review Papers & Proceedings* 105(5): 326–330.

[23] Holmström, Bengt. 1979. Moral Hazard and Observability. *Bell Journal of Economics* 10(1): 74–91.

[24] Holmström, Bengt. 1982. Moral Hazard in Teams. *Bell Journal of Economics* 13(2): 324–340.

[25] Imas, Alex. 2014. Working for the Warm Glow: On the Benefits and Limits of Prosocial Incentives. *Journal of Public Economics* 114: 14–18.

[26] Kitzmueller, Markus, and Jay Shimshack. 2012. Economic Perspectives on Corporate Social Responsibility. *Journal of Economic Literature* 50(1): 51–84.

[27] Kotchen, Matthew. 2006. Green Markets and Private Provision of Public Goods. *Journal of Political Economy* 114(4): 816–834.

[28] Lindahl, Erik. 1919. Just Taxation—A Positive Solution. In *Classics in the Theory of Public Finance*, eds. Richard A. Musgrave and Alan T. Peacock. London: Macmillan.

[29] Mainwaring, Simon. 2019. Purpose at work: How Hershey stands behind youth to create the future. *Forbes*, December 3. `https://www.forbes.com/sites/simonmainwaring/2019/12/03/purpose-at-work-how-hershey-stands-behind-youth-to-create-the-future/`

[30] Musgrave, Richard A. 1959. *The Theory of Public Finance: A Study in Public Finances.* New York: McGraw-Hill.

[31] Patagonia. 2024. Our footprint. Corporate website. Accessed October 2025. `https://www.patagonia.com/our-footprint/`

[32] Phin. 2025. Phin for good. Corporate website. Accessed August 8, 2025. `https://www.phinforgood.com`

[33] Prendergast, Canice. 2007. The Motivation and Bias of Bureaucrats. *American Economic Review Papers & Proceedings* 97(1): 180–196.

[34] Prendergast, Canice. 2008. Intrinsic Motivation and Incentives. *American Economic Review Papers & Proceedings* 98(2): 201–205.

[35] ProPublica. 2021. America's richest school serves low-income kids. But much of its Hershey-funded fortune isn't being spent. May 28. `https://www.propublica.org/article/americas-richest-school-serves-low-income-kids-but-much-of-its-hershey-funded-fortune-isnt-being-spent`

[36] Rosen, Sherwin. 1986. The Theory of Equalizing Differences. In *Handbook of Labor Economics*, Vol. 1, eds. Orley Ashenfelter and Richard Layard. Amsterdam: Elsevier.

[37] Samuelson, Paul A. 1954. The Pure Theory of Public Expenditure. *Review of Economics and Statistics* 36(4): 387–389.

[38] Spenkuch, Jörg L., Edoardo Teso, and Guo Xu. 2023. Ideology and Performance in Public Organizations. *Econometrica* 91(4): 1171–1203.

[39] The Hershey Company. 2024. Community—employee impact. Corporate website. Accessed October 22, 2025. `https://www.thehersheycompany.com/en_us/community.html`

[40] TOMS. 2024. Impact. Corporate website. Accessed October 2025. `https://www.toms.com/en-us/impact`

[41] Tonin, Mirco, and Michael Vlassopoulos. 2015. Corporate Philanthropy and Productivity: Evidence from an Online Real Effort Experiment. *Management Science* 61(8): 1795–1811.

[42] TriplePundit. 2024. How corporate donations can inspire employee engagement. December 17. Accessed August 8, 2025. `https://www.triplepundit.com/story/2024/corporate-donations-employee-engagement/799576`

[43] Warby Parker. 2024. Our impact. Corporate website. Accessed October 2025. `https://www.warbyparker.com/impact`