

Can Socially Responsible Firms Survive Competition? An Analysis of Corporate Employee Matching Grants

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Abstract

Fifty-five percent of S&P 500 firms have employee matching grant schemes. Matching grants act as a coordination mechanism which reduces free-riding by socially conscious employee-donors who value a public good but prefer someone else to pay for it. The popularity of matching schemes demonstrates that socially responsible firms can survive market competition. Our model shows that when socially conscious employees are more productive or value working together matching schemes can enhance the welfare of these employees and raise more for charities without reducing profits for investors in firms in competitive labor and capital markets. We document that labor productivity is higher at firms with matching schemes and that these firms are also more likely to be ranked as one of the “100 Best Companies to Work for.”

Keywords: Employee matching grants, corporate social responsibility, stakeholder society

JEL codes: D03, D21, H41, L31

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Can Socially Responsible Firms Survive Market Competition? An Analysis of Corporate Employee Matching Grants

“The Social Responsibility of Business Is to Increase Its Profits.”
Milton Friedman (1970)

Two hundred and seventy-six firms currently included in the S&P 500 index have employee matching grant schemes which support charitable organizations. As one example, Microsoft matches employee donations of up to \$12,000 per employee per year and in 2010 the program raised \$96 million with over 62 percent of employees participating.¹ We show that corporate donations and in particular, employee matching grants, can act as coordination mechanisms to mitigate free-riding by employee-donors (who value a public good but still prefer others to pay for it). Such schemes can enhance the welfare of socially conscious employees and the communities the charitable organizations serve without reducing the profits available for investors. Investor profits are not reduced since the cost of the match is borne by the employees in the form of reduced wages. Because employees bear the cost of the corporate donation, firms without donation programs are able to offer higher wages and workers will defect to them unless teams of socially responsible employees are either more productive or value working with like-minded colleagues. We find that labor productivity is higher at firms that do have matching schemes, and that those firms are also more likely to appear on the list of “100 Best Companies to Work for” published by Fortune Magazine. Thus, socially responsible firms can indeed survive market competition.

Corporate donations to charitable organizations can take two different forms: direct lump-sum donations and employee matching grants. Corporate matching grant schemes typically match individual employee donations to an approved list of nonprofit organizations up to some dollar limit. For some companies the matching scheme also applies to donations by the directors and retirees. Based on the data compiled by *HEP Development Services*, there are over 1,800

¹ See the March 2011 issue of *Matching Points: News and Developments in Matching Gifts*, published by HEP Development Services.

organizations in the U.S. which have matching grants schemes. Descriptive properties of these schemes are listed in Table 1.

[Please Insert Table 1 Here]

For convenience, employees who value public goods are termed “socially conscious,” and those who do not are described as “regular” employees. Similarly, firms which donate to charities are termed “socially responsible,” and those who do not are described as “regular” firms. Our analysis starts with a setting where all employees are socially conscious and wish to donate to a charity which provides a public good. We first establish an equivalence result: both corporate employee matching grants and lump-sum donations can act as coordination mechanisms that mitigate free-riding, increase the total charitable donation, and achieve the first-best solution.

However, regular companies may be able to attract these socially conscious employees away from socially responsible firms by offering higher wages. We show that socially conscious employees are less vulnerable to “poaching” by regular firms when a corporate donation takes the form of a matching grant rather than a lump-sum donation. We determine two alternate conditions for the existence of a separating equilibrium where socially conscious employees work for socially responsible firms which have matching grant schemes and regular employees work for regular companies. One such condition is that labor productivity is higher when teams of socially conscious employees work together. The other is that socially conscious employees simply enjoy working with like-minded colleagues. Based on an empirical analysis of approximately 1700 publicly traded companies, we find supportive evidence that labor productivity at firms offering matching grants is significantly higher and that employee satisfaction is also more likely to be higher as the firms offering matching grants appear more frequently on *Fortune Magazine*’s list of the “100 Best Places to Work for”.

Our paper contributes to the literature on corporate social responsibility which lies at the heart of corporate governance; see Friedman (1970), Porter (1992), Freeman (2001), Benabou and Tirole (2010) among others. Tirole (2006, pp. 56-64) summarizes the debate concisely: All participants agree with the goals of a stakeholder society but differ in how best to implement them. Shareholder-value proponents argue it is best to use contractual protection and regulation

to control externalities associated with a shareholder focus, while the stakeholder-value proponents favor board representation for varying groups of stakeholders. Our contribution to the debate is to show that it is possible for corporations to improve the welfare of employees and communities without reducing profits for investors.

Many papers have examined corporate philanthropy. Heinkel, Kraus and Zechner (2001) and Barnea, Heinkel and Kraus (2005, 2009) model a setting in which corporate spending on public goods reflects shareholder preferences. This analysis focuses on investor welfare and analyzes the equilibrium effect on stock prices when investor portfolio choice is influenced by corporate donations. Another view of corporate giving is that it is a perk enjoyed by managers². When corporate governance is weak and free cash flows are plentiful, corporate giving to managers' favorite charities is potentially a manifestation of the agency issues recognized in Jensen (1986). Brown, Helland and Smith (2006) empirically link corporate charitable giving with measures of potential agency problems: firms with larger boards and lower debt ratios tend to give more. Our paper's focus is not on investor welfare or managerial perks.

Corporate donations or spending on social and environmental projects are not necessarily different from ordinary business expenditures incurred to increase shareholder wealth. For example, corporate donations may simply be a marketing strategy to improve the public image of the corporation (see Mescon and Tilson (1987) and Galaskiewicz (1997)). Navarro (1988) recognizes that donations to local environmental protection and local educational institutions may reduce the costs of production and thereby maximize shareholder wealth. Elfenbein, Fisman and McManus (2012) show that charitable contributions can be used as a signaling mechanism for quality assurance in a marketplace and Lev, Petrovits and Radhakrishnan (2010) document a positive relation between corporate charitable contributions and customer satisfaction. Chava (2011) and Cheng, Ioannou and Serafeim (2011) find that better corporate social and environmental performance improves access to capital markets and Gillan et al. (2011) find that operating performance, efficiency, and firm value tend to increase with firms' performance on environmental, social and governance criteria. This paper differs in that we do not examine spending on social and environmental projects by firms directly. Instead, we examine

² Yermack (2009) provides evidence that managers time their share donations to their own family foundations, sidetracking the insider trading regulations to obtain tax benefits.

decentralized employee donations that do not affect production processes, product market competition, or access to the financial markets.

Focusing on employee utility in competitive capital and labor markets reflects the recent emphasis on human capital as a key asset in firm production (as in Zingales (2000) and Akerlof (2007)). Dignity in the work place has been investigated by the sociologist Randy Hodson who finds that employees want to view what they do as useful: Workers who are unable to obtain such satisfaction are likely to take actions that reflect their displeasure (Hodson 2001). Carlin and Gervais (2009) study how a manager's work ethic can affect the optimal employment contract and firm value. Berk, Stanton and Zechner (2010) develop a model in which human capital is a determinant of firm capital structure. Filbeck and Preece (2003), Goenner (2008), Edmans (2011), and Ahmed, Nanda and Schnusenberg (2010) have used *Fortune Magazine's* annual list of "100 Best Places to Work For in America" to conclude that there is a positive relation between improved employee satisfaction and favorable stock market reactions in both the short- and long-run. We are not aware of either analytical or empirical work which addresses corporate employee matching grant schemes, which makes this the first study of the theoretical existence conditions and welfare effects of corporate matching grants and ties this analysis to an empirical investigation of the matching schemes observed in practice.

The next section shows that if all employees are socially conscious, then both corporate lump-sum donations and employee matching grants can achieve the first-best solution and thereby dominate a system of decentralized employee giving. Section 2 analyzes competition in the labor market because, all else being equal, regular firms can afford to offer higher wages that could induce socially conscious employees to "defect" so that corporate donation programs would not survive. We show that socially responsible firms with direct lump-sum donation programs will find it even more difficult to survive than firms with matching grant schemes. Provided socially conscious employees working in teams produce either more output or more employee utility and the match ratio is not too high, matching schemes can survive and lead to a Pareto improvement for all parties. Section 3 uses a numerical example involving Cobb-Douglas utility to illustrate the main points of Section 2. Section 4 contains an empirical analysis providing evidence that labor productivity is higher at firms which offer employee matching grants., By controlling for whether the firm is classified in the *KLD* data base as a generous giver, we show that the increased labor productivity associated with firms offering matching

grants is a distinct effect from any employee screening or linking social capital role that corporate donations may play and from any marketing or advertising benefit associated with corporate giving. In Section 5 we examine the alternative assumption that socially conscious employees working together at socially responsible firms enjoy non-pecuniary benefits and find firms with matching grants appear more frequently on *Fortune*'s annual list of "100 Best Companies to Work for". Section 6 concludes. The appendix shows that recognizing the personal and corporate tax deductibility of charitable donations does not affect the conclusions of our theoretical analysis.

1: Corporate Donations as a Coordination Mechanism

In this section, we consider the ability of a firm to act as a coordination mechanism for donations when all employees are socially conscious. We abstract from agency costs, advertising effects, and investor preferences and we assume that the markets for products, labor, and capital are competitive.

1.1: Corporate Lump-sum Donations

The recipient of a corporate donation is assumed to be a nonprofit organization which produces G units of a public good. We adopt the public good model of Warr (1982, 1983) and Bergstrom et al. (1986).³ The utility U^i of employee i , $i = 1, \dots, N$, is a function of her private consumption x_i and the total amount of the public good G . $U^i = U^i(x_i, G)$ is continuous and strictly quasi-concave, and the first and second-order derivatives satisfy

$$U_1 > 0, U_2 > 0, U_{11} < 0, U_{22} < 0, U_{12} \geq 0. \quad (1)$$

Thus, individuals have diminishing marginal utility with respect to both the public and private good and find that increased consumption of the public good does not reduce the marginal utility of the private good.

Suppose that there are N socially conscious *homogeneous* employees. In order to guarantee interior solutions, we assume that an employee's utility function satisfies the Inada

³ For a detailed account of the development of the public goods model and its application in philanthropy, see the survey by Andreoni (2006).

conditions $\lim_{x \rightarrow 0} U_1(x, G) = +\infty$, and $\lim_{x \rightarrow \infty} U_1(x, G) = 0$. The employee allocates her wage W_i between private consumption x_i and a donation g_i with $x_i + g_i = W_i$.

Firms are of two types: type S (socially responsible) and type R (regular). Type S firms donate to the charity while type R firms do not. Throughout this section, labor productivity is assumed to be the same at both types of firm. If firm S decides to donate an amount of g_l per employee, then in order to be able to compete in the product and capital markets its wage rate must satisfy the following condition

$$W_S + g_l = W_R, \quad (2)$$

where W_S and W_R are the wage rates paid by firms S and R respectively. A firm's total labor costs per employee are then unaffected by its donations, thereby keeping shareholder profits unchanged. The firm acts as a social planner by choosing the optimal lump-sum contribution to the charity expressed as $\bar{G}_l = N\bar{g}_l$, where \bar{g}_l is the per employee optimal lump-sum corporate donation and \bar{g}_l solves

$$\max_{g_l} U(W_R - g_l, Ng_l),$$

with the first-order condition

$$U_1(W_R - \bar{g}_l, N\bar{g}_l) = NU_2(W_R - \bar{g}_l, N\bar{g}_l). \quad (3)$$

Alternatively, suppose the firm decides not to donate to the charity; i.e., the firm chooses to be of type R . An employee will then contribute g_i which solves

$$\max_{g_i} U(W_R - g_i, g_i + (N-1)\bar{g}), \quad (4)$$

where \bar{g} is the equilibrium donation from each of the other employees. In a Nash equilibrium, every employee contributes \bar{g} which satisfies

$$U_1(W_R - \bar{g}, N\bar{g}) = U_2(W_R - \bar{g}, N\bar{g}), \quad (5)$$

and the total amount raised by the charity is $\bar{G} = N\bar{g}$. For future reference, the definitions of commonly used variables are listed in Table 2.

[Please Insert Table 2 Here]

Comparing the optimality equation (3) given a lump-sum corporate donation with the optimality equation (5) given decentralized employee giving, we see that coordination at the firm level reduces free-riding. This result is well-known in the public-good literature – see Samuelson (1954) and Chapter 2 of Laffont (1989). Given corporate lump-sum donations, the employee receives a reduced wage of $W_R - \bar{g}_l$. Since \bar{g}_l is the first-best per employee donation, employees have no desire to make additional private contributions.

Proposition 1: *Assume all employees are socially conscious. The total donation raised for the public good when employees give privately is less than that given a corporate lump-sum donation when the total cost to the firm of wages plus corporate donations is held constant.*

It is interesting to consider the substitutability of private and corporate giving. If the corporate donation per employee is above \bar{g} , then employees will not make any additional private contributions. But if the corporate donation per employee is between zero and \bar{g} , then employees will always donate enough to make up the difference. This is analogous to the Roberts (1984) result that government spending on public goods crowds out private donations⁴. We next consider employee matching grant schemes as an alternative to a lump sum corporate donation strategy and show that matching schemes can also mitigate the free-riding problem.

1.2: Employee Matching Grants

A firm of type S may institute a matching policy: for each dollar contributed by the employees, S will match it with h dollars.⁵ Here we use a single asterisk to denote variables (such as donations, wages, etc.) under the matching scheme. Thus g^* denotes each employee's direct

⁴ Also see Andreoni and Payne (2003) for experimental results on the “crowding-out” effect of government spending on private donations. Note that Proposition 1 is different from the Modigliani-Miller style irrelevance proposition in relation to corporate charitable donations derived by Zivin and Small (2005). Zivin and Small model employee donations as a private good, not as a public good and hence their model does not address the issue of free-riding by donors.

⁵ Previous studies on matching behaviour and private donations can be found in Guttman (1978, 1985), Danziger and Schnytzer (1997), and Gong and Grundy (2010). These studies do not consider corporate matching grant schemes.

contribution to the public good. A firm of type S reduces wages by hg^* per employee relative to a firm of type R in order to fund the donation of the match. We solve for the first-best optimal match ratio and then compare and contrast a corporate lump-sum donation scheme with an employee matching grant scheme.

Under a matching scheme, the employee's utility function takes the form $U(W_S^* - g^*, G^*)$ where W_S^* is the wage rate given the matching scheme. Assuming all other employees choose to donate g^* , employee i 's maximization problem is:

$$\max_{g_i} U(W_S^* - g_i, (1+h)g_i + (N-1)(1+h)g^*).$$

The Inada condition $\lim_{x \rightarrow 0} U_1(x, G) = +\infty$ guarantees an interior solution and in a Nash equilibrium the first order condition is

$$-U_1(W_S^* - g^*, (1+h)Ng^*) + (1+h)U_2(W_S^* - g^*, (1+h)Ng^*) = 0. \quad (6)$$

Based on condition (6), the employee's optimal contribution to the public good is an implicit function of the match ratio h with a unique solution. We first note that each employee's donation is uniquely determined under a match ratio in Lemma 1. Proofs of all lemmas and propositions are contained in Appendix 1.

Lemma 1: *For each match ratio there is a unique optimal employee donation g^* .*

We now compare the total contribution to the public good under a matching scheme with that under decentralized employee giving. The optimality condition (6) can be rewritten as

$$U_1(W_R - (1+h)g^*, (1+h)Ng^*) = (1+h)U_2(W_R - (1+h)g^*, (1+h)Ng^*). \quad (7)$$

Intuitively, the individual employee's optimal donation under decentralized giving is achieved when the marginal utility of private consumption is equal to the marginal utility of the increase in the provision of the public good, as shown in equation (5). By contrast, under the matching system, the employee's optimal donation is achieved when the marginal utility from private

consumption is equal to the marginal utility of the increase in the provision of the public good due to the individual's direct donation plus the match, as shown in equation (7). Combined with our assumption in (1) that increased consumption of the public good does not reduce the marginal utility of the private good, we can establish that with a matching scheme the total employee donation plus the match exceeds the total donation under a decentralized giving scheme.

Proposition 2: *For any positive match ratio h , the total contribution to the public good under a matching scheme is greater than under a decentralized scheme.*

Proposition 2 has established that the charity is strictly better-off under a matching scheme than with decentralized giving. Recall that profits to the firm's investors are not affected. Recognition of the free-riding problem in decentralized giving is not new. But are employees better-off with a matching scheme? To answer this question, we need to find the match ratio h that maximizes employee utility and then compare the utility of the employees with and without such a matching scheme. In order to find the (employee) utility-maximizing h , we now establish that the total donation (employee plus firm) is increasing in the match ratio in Lemma 2.

Lemma 2: $(1+h)g^*(h)$ is increasing in h .

Assume that the socially responsible employer S , acting as a social planner on behalf of the employees, chooses the match ratio h so as to maximize employee utility given that the employees react according to equation (6). The firm chooses h by solving

$$\max_h U\left(W_R - (1+h)g^*(h), (1+h)Ng^*(h)\right), \quad (8)$$

with the first-order condition

$$\frac{dU}{dh} = \left(g^*(h) + (1+h) \frac{dg^*(h)}{dh} \right) (-U_1 + NU_2) = 0. \quad (9)$$

From Lemma 2 we have $\frac{\partial(1+h)g^*(h)}{\partial h} = \left(g^*(h) + (1+h)\frac{dg^*(h)}{dh} \right) > 0$, and therefore the first-order condition can be simplified as $-U_1 + NU_2 = 0$. It is straight-forward to verify that the second-order condition is satisfied:

$$\frac{d(-U_1 + NU_2)}{dh} = \left(g^*(h) + (1+h)\frac{dg^*(h)}{dh} \right) (U_{11} - (N+1)U_{12} + NU_{22}) < 0. \quad (10)$$

For any given match ratio h , the optimality condition for the employee-donor has been derived in Equation (7). Equation (9) gives the optimality condition if the socially responsible firm acts as a social planner to coordinate employee donations by choosing h . Comparing (7) with (9) and noting Lemma 2, it is apparent that $h^* = N-1$ is the optimal match ratio.

Proposition 3: *The match ratio that maximizes employee utility is $h^* = N-1$.*

Applying Proposition 3, Equation (9) can be rewritten as

$$-U_1(W_R - Ng^*(h), N^2g^*(h)) + NU_2(W_R - Ng^*(h), N^2g^*(h)) = 0. \quad (11)$$

One corollary from Proposition 3 is that the employee's utility is an increasing function of the match ratio h for h in the interval $[0, N-1]$. Setting $h = 0$ corresponds to the case of no matching and this is always an option for firm S . Since the utility maximizing match ratio exceeds 0, employees can be strictly better off when firms offer matching grants. Similar reasoning applies when we consider corporate lump-sum donations. As discussed in Section 2.1, a zero lump-sum donation is always an option for firm S , but by acting as a social planner and coordinating employee donations the firm can maximize employee utility. The following proposition summarizes these findings.

Proposition 4: *When all employees are socially conscious, they are strictly better off working at socially responsible firms that offer either a match ratio of $h = N-1$ or a lump-sum donation equivalent to \bar{g}_l per employee than working at firms that are not socially responsible.*

1.3: Equivalence between Employee Matching Grant Schemes and Lump-sum Donations When Employees are Homogeneous

It is straight-forward to see that, when $\bar{g}_l = Ng^*(h)$, (3) and (11) are identical. This indicates that both corporate lump-sum donations and employee matching grants can achieve the same first-best optimal solution. We have established the equivalence between corporate direct lump-sum donations and matching grants when all employees are socially conscious.

Proposition 5: *At an optimal match ratio $h = N - 1$, a matching grant scheme is equivalent to optimal corporate direct lump-sum giving.*

Propositions 4 and 5 imply that when all employees are socially conscious, every firm should coordinate employee donations, either through lump-sum donations or employee matching grant schemes. While an employee's consumption of private and public goods remains the same under both forms of corporate donation strategy, one crucial difference is in the employee's take-home wage. Under the optimal corporate lump-sum donation approach, each employee's take-home wage is $W_R - \bar{g}_l = W_R - Ng^*(h)$ with $g^*(h)$ evaluated at $h = N - 1$, and private donation to the public good is zero. Under the optimal matching grant scheme, each employee's take-home pay is $W_S^* = W_R - hg^*(h) = W_R - (N - 1)g^*(h)$ and the employee contributes $g^*(h)$, evaluated at $h = N - 1$. Therefore, an employee's take-home pay is higher under a matching grant scheme, and each employee contributes the additional sum of $g^*(h)$ to the charity.⁶

The optimal match ratio of $N - 1$ is much higher than that observed in practice, as seen in Table 1. We now show that the level of match ratios observed in practice may be the result of competition for labor when competing regular firms are willing to offer higher wages. Further, employee matching schemes are better able to survive in competitive labor markets than corporate lump-sum giving.

⁶ In the current setting, the employee's utility remains the same under either direct giving or employee matching grant schemes. However the situation may be different in an impure public goods setting where employees also enjoy private benefit of giving, termed 'warm-glow' by Andreoni (1989). The difference caused by this non-pecuniary benefit for employees is explored in Section 5.

2: Corporate Donations and Labor Market Competition

Firms can choose to be socially responsible with either employee matching grant schemes or lump-sum donations, or regular with no corporate contributions to the charity. In this section we assume that firms are otherwise identical in that the productivity of their employees is unaffected by the firm's choice of type. All firms offer the same total pay package determined in a competitive labor market.

Will a socially conscious employee earning W_S at a socially responsible firm have an incentive to switch to a higher-paying position offering W_R at a regular firm? Our next proposition highlights the difficulty of retaining employees in the face of competition from firms without corporate giving programs.

Proposition 6: (a) *If a firm offers an employee matching grant scheme with a fixed match ratio, employees are better off by defecting to a regular firm.* (b) *Similarly, if a firm donates a fixed amount to charity, employees are better off by defecting to a regular firm.*

Proposition 6 effectively states that if there is to be an equilibrium without defection in the current set-up of the problem, any matching grant scheme ratio must be of the form $h = h(N)$. One simple solution that will prevent defection is

$$h(N) = \begin{cases} N-1; & \text{if no one defects} \\ 0 & ; \quad \text{if one or more defect.} \end{cases}$$

Defection by even one employee will lead to the loss of the entire match.

We now consider alternate settings in which employee matching schemes with a fixed match ratio can survive because there is a benefit that will be lost if a socially conscious employee defects from a socially responsible firm.

2.1: Surviving Labor Market Competition: Increased productivity of socially conscious teams

In this subsection, we discuss a necessary condition for the survival of employee matching grant schemes with a fixed match ratio. If socially conscious employees are more

productive when they work together in a team, either because they produce more of the firm's product or their interaction produces a direct utility benefit to them, then socially conscious employees will be reluctant to defect to a regular firm. Further, we will show that employee matching grant schemes are better able to retain socially conscious employees than lump-sum donation programs.

Previous research has suggested that there can be a difference in labor productivity when social interaction matters for employees. Firms with charitable foundations may attract employees who are passionate about particular social or environmental concerns and are linked through this common interest. Sociologists have coined the phrase 'social capital' to describe "features of social life-networks, norms, and trust that enable participants to act together more effectively to pursue shared objectives" (see Putnam (1993)).⁷ Corporate donations can act as linking social capital. Hamilton, Nickerson and Owan (2003) conclude that more productive workers tend to join teams first, even despite a loss in earnings, and conclude that this is evidence that some workers derive non-pecuniary benefits from teamwork. Sabatini (2008) concludes that the linking social capital of voluntary organizations improves labor productivity in a set of small-to-medium sized Italian enterprises. Further evidence comes from Brekke and Nyborg (2008) who show that employers may be able to use the firm's corporate social responsibility profile as a screening device to attract more productive workers. Section 4 of this paper provides empirical evidence of higher labor productivity for firms which have employee matching grant schemes.

2.2: Retaining Employees: matching grants vs. lump-sum donations

Assume that the labor productivity of teams of socially conscious employees is $W_R(1 + \Delta)$ with $\Delta \geq 0$. Given higher labor productivity, socially responsible firms can afford to pay higher salaries, thereby reducing the incentive for its employees to defect. The following proposition establishes the superiority of employee matching grants over lump-sum schemes in retaining employees.

⁷ There are a number of books and surveys on this topic; see Dasgupta and Serageldin (2000), Sobel (2002) and Sabatini (2006) among others.

Proposition 7: *Assume that socially conscious employees are more productive in socially responsible firms. Comparing a lump-sum donation scheme to a matching grant scheme that raises the same total amount, the productivity gain Δ necessary to preclude switching is smaller when the firm has a matching scheme than when it makes a fixed lump-sum donation.*

Under a mixed scheme firms' donations to charities are packaged as part lump sum and part matching, Proposition 7 implies that a two-part scheme will be less effective in maintaining the separating equilibrium than if the entire corporate donations were packaged as an employee matching grant.⁸ In a related setting of a large donor and multiple small donors, Gong and Grundy (2013) show that a two-part scheme will raise less money than if the entirety of the large donor's gift is packaged as a matching grant.

2.3: Existence of a Separating Equilibrium with a Matching Grant Scheme

While the productivity gain necessary to preclude switching is smaller for a matching scheme than a lump-sum donation scheme, the question of whether there exists a separating equilibrium in which socially conscious employees choose to remain with socially responsible firms is still to be addressed. Provided socially-conscious employees are more productive when they work together in teams at socially-responsible firms, socially-responsible firms have some room to improve the total package offered to employees. Proposition 8 establishes that this flexibility is always sufficient to prevent defections to regular rival firms. Proposition 8 relies on Lemmas 3 and 4.

Lemma 3: $\lim_{h \rightarrow \infty} (1+h)g^*(h) = (1+\Delta)W_R$.

Lemma 3 states that as the match ratio becomes infinite, the private good consumption of socially conscious employees approaches zero.

Lemma 4: There exists a match ratio \bar{h} such that $\bar{h}g^*(\bar{h}) = \Delta W_R$.

⁸ In reality, many firms have both types of schemes because each program serves a different purpose. For example, lump-sum donations can serve an advertising role or be a top executives' pet project, while employee matching grants can be more aligned with employee satisfaction.

Lemma 4 states that there exists a critical match ratio at which the firm's matching donation per employee is exactly equal to the additional productivity of socially conscious employees working in a team relative to the productivity of regular employees.

Proposition 8: *There exists a separating equilibrium in which teams of socially conscious employees choose to work together in socially responsible firms offering matching grant schemes and regular employees choose to work for regular firms.*

Although it is always possible to preclude defection, it is not necessarily the case that the match ratio that maximizes employee utility in the absence of competition from regular firms is consistent with a separating equilibrium. Proposition 3 has established that when all firms and all employees are socially conscious, the match ratio that maximizes employee utility is $h^* = N - 1$. This far exceeds the match ratios observed in practice as set out in Table 1B. One natural explanation for why we do not see extremely high match ratios is that very high match ratios imply such low wages at socially responsible firms that competition from regular firms (offering higher wages and no match) would tempt even the most magnanimous of socially conscious employees.

Proposition 9: *Defection will always occur at high enough match ratios if*

$$U(W_R, (N-1)(1+\Delta)W_R) > U(0, N(1+\Delta)W_R).$$

Expressed in words, the inequality condition in Proposition 9 simply states that zero consumption of private good will give an extremely low level of utility even for socially conscious employees who value the public good. Mere survival requires some private consumption and this naturally leads to defection when the match ratio becomes high enough.

3: A Numerical Example

Assume that employee-donors have Cobb-Douglas utility: $U(x, G) = x^\alpha G^\beta$. It can be shown that the Nash equilibrium donation is $g^*(h) = \frac{\beta(1+\Delta)W_R}{\alpha N + \beta(1+h)}$. Guided by the insight obtained from Lemma 4 and Proposition 8, we determine the match ratios for which a separating equilibrium can exist. The critical value of the match ratio \bar{h} at which $\bar{h}g^*(\bar{h}) = \Delta W_R$ (and hence wages at the type S firm are identical to those at a type R firm) is $\bar{h} = \frac{(\alpha N + \beta)\Delta}{\beta}$.

For $\alpha = \beta = 0.5$, $N = 100$, $\Delta = 2\%$ and $W_R = \$10,000$, the critical value of $\bar{h} = 2.020$. A separating equilibrium exists for match ratios slightly higher than 2.020. For instance, it is easy to verify that, when $h = 2.030$, take-home pay at firm S is $W_S = \$9,999.03$, which is lower than W_R and thus there is no incentive for regular workers to move from firm R to firm S . When $h = 2.030$ the utility of a socially conscious employee who remains at firm S is 17,232.88, which is higher than the maximum level of the utility she will conjecture that she can achieve by moving to firm R , this maximum being 17,232.85. This maximum level is associated with a conjecture that all the other employees will stay at firm S and that those who stay will continue to make the same donation as they made before the defection. Given such a conjecture, the parameter values are such that a switcher would then optimally cease all donations post the switch.

For a slightly higher value of h of 2.031, socially conscious employees will find switching to type R firms attractive. Since $U(W_R - (1+h)g^*(h), (1+h)Ng^*(h))$ is increasing in h for all $h < N-1$, the separating equilibrium with the highest level of employee utility is achieved at a match ratio at 2.030.

Further calculations show the comparative static relations between the optimal match ratio consistent with a separating equilibrium and each of (i) the per employee productivity gain of Δ , (ii) the number of employees in firm S , and (iii) the employees' preference parameter α . The higher the per employee productivity gain of Δ for teams at socially responsible firms, the higher the optimal match ratio that can be offered. This is demonstrated in Panel A of Table 3. It

is intuitive since the incentive to switch to a higher-paying regular firm is reduced if greater productivity at firm S allows a higher match without a reduction in the wage.

[Please Insert Table 3 Here]

The relation between the optimal match ratio and the number of socially conscious employees is positive, as illustrated in Panel B of Table 3. With the ability to free-ride on the generosity of a greater number of employee donors, each employee will reduce her gift. In turn the firm's match per employee is reduced and the wage offered by firm S rises. The incentive to defect is then reduced and a separating equilibrium can be maintained at a higher match ratio. Finally, the higher the preference parameter associated with the private good, the higher the optimal match ratio. This can be seen from panel C of Table 3. The higher the value of α , the smaller the amount that the employees will donate for any given match ratio and the firm's match per employee will be reduced. At an unchanged match ratio the wage offered by firm S will rise. The incentive to defect will be reduced and again a separating equilibrium can be maintained at a higher match ratio. Somewhat ironically, the end result is that when the utility function of socially conscious employees places *less* weight on the public good, socially responsible firms can offer higher matches.

In order to investigate this first explanation of how socially responsible firms can survive competition from regular firms offering higher wages, namely that socially conscious employees working in teams can be more productive than regular workers, we turn to an empirical examination of labor productivity and matching schemes.

4: Empirical Findings on Matching Grants and Labor Productivity

A full empirical analysis of our model's predictions requires data beyond what is contained in the HEP Development Services database.⁹ Nevertheless, some interesting analysis can be undertaken with the available data. We examine the set of firms included in Standard and

⁹ For example, we do not know when a firm first began to offer employee matching grants, or the total size of each firm's employee matching grants. The database only offers a snapshot at one point in time of whether a firm has such a program, the match ratio, and any limit on the size of the match per employee. Thus, we are unable to answer questions regarding causality. While endogeneity is an interesting question, it is not central in our empirical analysis of whether the condition of differential labor productivity between matching firms and non-matching firms that can underlie the existence of a separating equilibrium is indeed satisfied.

Poor's *ExecuComp* data base in the year 2009. *ExecuComp* includes both active and inactive firms in the S&P 1500 index, plus a handful of other firms. Financial information was obtained from Compustat for the years 2005 through 2009. To be included in the sample, information must be available on the firm's Book Value of Assets, Number of Employees, and pre-tax Operating Income before Depreciation and the firm must have a non-negative book value of equity. Matching grant information is obtained from www.hepdata.com for May 18, 2010. This screening procedure yields 7,872 firm-year observations; 27.6% of which come from firms with matching grants.¹⁰

Labor productivity is defined as pre-tax Operating Income before Depreciation divided by the number of Employees. Asset values and profits are deflated to year 2005 dollars with GDP deflators obtained from the website of the Federal Reserve Bank of St. Louis. Detailed data definitions are contained in Appendix 2. Summary statistics for the complete set of firms are reported in Panel A of Table 4. Summary statistics for firms with and without matching grant schemes are reported in Panels B and C respectively.

Firms offering matching grants are typically larger in terms of their book value of assets (median values of \$5.21 billion vs. \$1.25 billion) and number of employees (median values of 11,250 vs. 3,590). Firms with matching grants also perform better. The average return on assets (ROA) is 14%, as compared with 12% for firms without matching grants. The *t*-statistic for the difference in return on assets between the two groups is 4.8997 (with a *p*-value of 0.0000). They have higher average Tobin's *Q* at 1.49. By contrast, the average Tobin's *Q* for non-matching firms is 1.58 and the *t*-statistic for the difference in Tobin's *Q* is 2.9794 (with a *p*-value of 0.0014). It also appears that firms offering matching grants have higher labor productivity as the median (mean) is \$56,230 per year (\$137,440 per year); while firms without such programs have a median productivity of \$35,750 per year (\$77,140 per year). The two-sample *t*-statistic for a test of the difference in labor productivity between firms with matching grants and firms without matching grants is 6.4852 with a one-sided *p*-value of 0.0000.

[Please Insert Table 4 Here]

¹⁰ Note that a much higher proportion of S&P 500 firms offer employee matching grants: as of January, 2010, 276 of the S&P 500 firms offer matching grants.

For our main test of differences in labor productivity, we consider a simple Cobb-Douglas production function with inputs of labor L and capital K ,

$$Q = \xi K^\alpha L^{\beta_1 + \beta_2 M} \quad \text{where } M = \begin{cases} 1, & \text{if the firm has a matching scheme;} \\ 0, & \text{otherwise.} \end{cases} \quad (12)$$

Q is the operating income before depreciation of the firm. ξ is a scalar interpreted as a productivity factor. Our hypothesis is that one way to ensure that socially responsible firms can survive market competition and hence that a separating equilibrium can exist, is that firms with employee matching grants enjoy higher productivity; i.e., that $\beta_2 > 0$.

Dividing both sides of the production function (12) by L and taking logs, we have

$$\ln(Q/L) = \ln(\xi) + \alpha \ln(K/L) + [\beta_1 - (1 - \alpha)] \ln(L) + \beta_2 M \times \ln(L).$$

Thus, we test whether the estimated β_2 parameter is positive in the following regression:

$$\ln(Q_{it}/L_{it}) = \lambda_0 + \lambda_1 \ln(K_{it}/L_{it}) + \lambda_2 \ln(L_{it}) + \lambda_3 M_i \times \ln(L_{it}) + \sum_{j=1}^J \gamma_j X_{j,it} + e_{it}, \quad (13)$$

where X_j 's are a set of control variables. The estimated value of λ_0 is an estimate of $\ln(\xi)$, $\hat{\lambda}_1$ is an estimate of α , and $\hat{\lambda}_2$ is an estimate of $[\beta_1 - (1 - \alpha)]$ the sign of which is ambiguous since both β_1 and $1 - \alpha$ are positive. The important estimate for our purposes is $\hat{\lambda}_3$ which measures the increased elasticity of operating profit with respect to labor input for firms with matching schemes relative to those without such schemes.

The regression includes a number of control variables. Recent studies have suggested that firm performance is influenced by both corporate governance (Gompers, Ishii and Metrick 2003) and competitiveness in product markets (Giroud and Mueller 2011). Therefore, we add the G -index to measure the strength of corporate governance and a Herfindahl index to measure a firm's market power. Values of the G -index were obtained from Andrew Metrick's website. The G -index has been compiled infrequently and we use a firm's year 2004 G -index value for the year 2005 sample, and its year 2006 G -index value for observations from years 2006 to 2009. Annual values of a Herfindahl index (H -index) are calculated for each of the 38 Fama-French industry classifications based on 4-digit SIC codes. The 38 industry definitions are found on Ken French's website. The calculation of the annual value of the H -index for each such industry is

based on sales data for the set of firms in the sample that year. A third control variable is the one-year lagged investment in Research and Development (R&D). Productivity may depend not only on a firm's capital and labor, but also on how much of the capital represents recent investment in R&D.

Corporate donation programs have been argued to have the benefits of increasing profits as an advertising, employee screening or linking social capital mechanism quite apart from the employee matching grant nature of a scheme. To investigate this possibility we add a further control variable to the regression and collect the data item called *Generous Giving*, i.e., the variable denoted by “com-str-a”, from the *KLD* database. This dummy variable takes the value of 1 if the company has consistently given over 1.5% of trailing three-year net earnings before taxes to charity, or has otherwise been designated by *KLD* as notably generous in its giving.

Pooled OLS results are reported in Panel A of Table 5 where the *t*-statistics are robust to heteroscedasticity and clustering of residuals at the firm level.¹¹ As suggested by Petersen (2009), clustered standard error estimates are used to adjust for the correlation of residuals within a firm. The regressions are estimated both with and without a sector effect. We attempt a control for any sector effects on the total productivity factor ξ that are distinct from the degree of industry concentration. We do so by using a set of sector dummies created by classifying firms into ten sectors based on their Global Industry Classification Standard (GICS) codes. In all six variants of the regression (i.e., with and without sector effects and including various number of the control variables), firms with matching grants have significantly higher productivity at the 1% level. The estimated coefficient on the product of the matching dummy and the natural log of the number of employees varies across the regressions and ranges between 0.0335 and 0.0655; i.e., the estimated elasticity of operating profit with respect to labor input is 3.35% to 6.55% higher for firms with matching schemes than for comparable firms without a match.

We also undertake a GLS random effect panel data analysis and these results are reported in Panel B. The estimated relation between matching grants and productivity is quite similar to that estimated using pooled OLS. Each of the six regressions reported in Panel B imply that matching grants are associated with significantly greater productivity, at least at the 5% level.

¹¹ All the regressions reported in Table 5 have been repeated on a sub-sample in which we delete both the top and bottom 0.5% of observations based on inflation-adjusted profit levels. The sign and significance of the estimates are unchanged. These results are available upon request.

[Please Insert Table 5 Here]

The negative estimate of the coefficient on the *H*-index suggest that companies in more concentrated industries have lower productivity, consistent with increasing managerial agency problems and/or growing union power in less competitive industries. Firms with low values of the *G*-index are viewed as firms with strong shareholder rights and hence the significant negative coefficient on the *G*-index in columns (5) & (6) of both Panels A and B is consistent with effective corporate governance having a positive impact on firm performance. The fact that the *KLD* “Generous Giving” control variable does not have a significantly impact on labor productivity points to the importance of the matching grant nature of the corporate donations investigated in this study¹². Note that the insignificant coefficient on “Generous Giving” does not rule out the possibility that lump-sum donations have as a form of advertising (Navarro 1989), - or are a reflection of shareholder or director preferences (Heinkel, Kraus and Zechner 2001). However, a detailed study on this issue is beyond the scope of this paper. Furthermore, the lack of significance of the coefficient on “Generous Giving” is not a reflection of high correlation between a matching dummy and a generous giving dummy—the correlation between the two measures is only 10.76%.

This section has investigated whether socially conscious employees working together in teams are more productive than regular workers. An alternate explanation for how socially responsible firms can survive competition from regular firms is that socially conscious employees enjoy a direct utility benefit from team membership at socially responsible firms. They would lose this benefit if they were to defect to a higher-paying regular firm. In the next section, we investigate empirically this additional possibility.

5: Employee Satisfactions and Matching Grants

As pointed out by Andreoni (1989), many donors enjoy a private psychological benefit from the act of giving, termed “warm glow.” In Andreoni’s analysis, an individual’s donation to the public good enters into his utility function at two levels, once as part of the public good, G , and a second time based on the size of his own donation g_i : $U_i = U_i(x_i, g_i, G)$. Proposition 5

¹² The coefficient of correlation between matching grants and labor productivity is 0.0658, while the correlation between “Generous Giving” variable and labor productivity is -0.0059.

established that when $U_i \equiv U_i(x_i, G)$, employee matching grant schemes can be equivalent to a corporate lump-sum donation scheme. But, if the act of giving has utility in itself but does not have as large an impact when a donation is effectively made via reduced wages, employee contributions to the charity directly may dominate corporate giving on behalf of employees.

Employee satisfaction can go beyond the individual “warm glow” induced by the employee’s personal contributions to the charity. People can enjoy working with like-minded individuals and this may lead to the higher labor productivity investigated in Section 4. But even without such a benefit, as long as employees value working with those who support the same causes, a matching scheme can act not only as a *coordination* mechanism to mitigate free-riding in the provision of public goods, but also as a *bonding* mechanism for team members.

For employees who enjoy a warm glow from team membership, a move to a regular company will reduce their utility, other things being equal. Such non-pecuniary benefits may make socially conscious employees at socially responsible firms reluctant to move to a regular company despite the temptation of a higher nominal salary.

We use the list of *Fortune Magazine*’s “100 Best Companies to Work For in America” to test whether there is a positive relation between employee matching grant schemes and employee satisfaction. Since 1998, *Fortune Magazine* has published an annual list of the 100 firms judged to be the best places to work based on their employer-employee relations. The list is determined by the *Great Place to Work Institute* and the decision to include a firm on the list is based on employee surveys. Thus inclusion on the list can be treated as a direct measure of employee satisfaction¹³. Previous studies (for example, Ahmed et al. 2010 and Edmans 2011) report a link between corporate financial performance and membership of the list.

We investigate the following hypothesis: If employees enjoy a non-pecuniary benefit from working in firms with matching grant schemes (a variant of a “warm glow” effect), then the matching grant firms will be more likely to appear in *Fortune*’s “100 Best Companies to Work for in America”. Based on the lists from 2006 to 2010, Panel A of Table 6 reports that 4.79% of

¹³ The survey includes two parts. Two-third of a company’s score is based on 57 questions. One of the questions is whether the company has employee matching grants. However, in an e-mail communicated to the authors, one of the institute’s founders, Milton Moskowitz stated that “This is NOT a major criterion in selection of the list. It is just one of many attributes checked off. A company would not be severely handicapped by not having this program. The methodology of the list rests largely on the opinions of employees who take our survey. Their answers to 57 questions account for two-thirds of the final score. The remaining one-third comes from our evaluation of the programs and benefits offered by applicants, and matching grants do not have any strong weight by themselves.” For a more detailed description of how the list is compiled, see www.greatplacetowork.com.

the firms in our sample of firms from *ExecuComp* with matching grants also appeared on the “100 Best” list. Only 1.35% of firms without matching grants did. More tellingly, Panel B of Table 6 reports that a firm with a matching grants scheme and not on the list seems to find it easier to “break” into the ranking in the subsequent year: the chance of inclusion in the following year is 1.36%. By contrast a firm without matching grants has only a 0.18% probability of being ranked in the subsequent year. The Chi square test statistic is 33.14, with a p -value of 0.0000. Panel C of Table 6 indicates that a firm with matching grants and membership of the list has a 77.5% chance of continuing to be ranked in the following year, compared with a 76.92% for those members without matching grants. This difference is not statistically significant.

[Please Insert Table 6 Here]

To test further whether matching grants may be positively associated with inclusion in the “100 Best” list, a Probit regression analysis is employed and reported in Table 7. In this regression, the dependant variable is a dummy which takes a value of one if the firm appears on the list, and zero otherwise. The independent variables are a dummy variable for matching grant schemes and control variables are lagged labor productivity, log of book assets, log of the number of employees, H -index, G -index, lagged R&D and the KLD variable, “Generous Giving.” Standard errors are adjusted for clustering at the firm level, as we have a repeated sampling of the firms’ appearance on the “100 Best” list in each year between 2006 and 2010. Using five years of financial data from 2005 to 2009¹⁴, we find that firms with matching grants are more likely to appear on the “100 Best” list. This relation is significant at the 1% level in the absence of controls and when only the KLD “Generous Giving” variable is included as a control variable. Firms offering matching grants are more likely to be included in the “100 Best” list even after controlling for the fact that generous giving in itself seems to make for a happier workforce. This later observation points to a bonding social capital role of giving that is further enhanced by a matching scheme.

The relation between inclusion in the list and having a matching scheme remains significant at the 10% level when the full set of controls is considered. The only one of the

¹⁴ Due to the time delay in releasing the survey results, we match year the 2010 “100 Best Companies to Work for in America” list with financial data from year 2009, and so on.

additional controls that is significant is lagged R&D. That fact more R&D-oriented firms have a better chance of appearing on the list suggests that more innovative firms have higher employee satisfaction. It is interesting to note that the lagged labor productivity does not play a significant role in firms' appearance on the "100 Best" list, highlighting the unique role of employee matching grants in improving employees' job satisfaction.

[Please Insert Table 7 Here]

The empirical analyses in this and the previous section suggest that the conditions for the existence of a separating equilibrium may well be satisfied in practice: socially conscious employees may choose to work for socially responsible firms which offer matching grants and have higher labor productivity and perhaps higher employee satisfaction.

To complete our analysis of the optimality of employee matching grant schemes, Appendix 3 re-examines the Propositions developed above in the light of the tax deductibility of individual and corporate donations. The Propositions are shown to be unaffected by the tax deductibility of donations.

6: Conclusion

We have addressed the relation between corporate philanthropy and firms' human capital. When socially conscious employees value both their private consumption and the provision of public goods, corporate donations, either a direct donation to a charity or an indirect employee matching grant, can act as a coordination mechanism to mitigate the free-rider problem among employee donors. In these circumstances corporate philanthropy is superior to individual employee personal donations. But corporate philanthropy is challenged when employees have an incentive to switch to regular firms paying higher wages. However, a separating equilibrium in which socially conscious employees work for socially responsible firms offering employee matching programs and regular employees work for regular firms can exist if teams of socially conscious employees are in fact more productive. The tax deductibility of corporate and individual donations does not alter this conclusion.

Judging from the real world prevalence of corporate employee matching grant programs, we conclude that teams of socially conscious employees produce either a pecuniary benefit of

increased labor productivity or a collective “warm-glow”. Our empirical investigation supports the view that firms with matching grant schemes enjoy higher labor productivity and that their employees are more satisfied.

In summary, when employees are socially conscious, companies can fund employee matching grants or lump-sum donations through a reduction in the wages paid to their philanthropic employees. Provided there is a benefit to being in the team, socially conscious employees will not be lured away by the higher wages of regular firms. The company’s shareholders need bear none of the cost of corporate giving. Why then is the company’s board feted for its “generosity”? The answer is because corporate donations can serve as a coordination mechanism that allows the employees to achieve their preferred combination of private and public good consumption. The employees prefer that combination to what they would have achieved if they were paid more at regular firms and had to make their donations individually. And the charities are able to raise more money than in the equilibrium of individual donations from better-paid employees. The corporation’s Board should be applauded for its “social responsibility” in implementing a Pareto improving outcome for employees, charities and shareholders.

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Appendix 1: Proofs of Lemmas and Propositions

Proof of Lemma 1: The proof proceeds by contradiction. Suppose the lemma were not true. Then for some h there would exist two different levels of employee contribution, g^{*H} and g^{*L} satisfying (6), with $g^{*H} > g^{*L}$.

Since g^{*L} satisfies (6),

$$U_1\left(W_R - (1+h)g^{*L}, (1+h)Ng^{*L}\right) = (1+h)U_2\left(W_R - g^{*L}, (1+h)Ng^{*L}\right). \quad (A1)$$

Suppose the employee increases her contribution from g^{*L} to g^{*H} . The left-hand-side of equation (A1) increases because $U_{11} < 0$ and $U_{12} \geq 0$. But the right-hand-side of equation (A1) decreases, since $U_{22} < 0$. This means that g^{*H} cannot satisfy equation (6) and thus g^{*H} cannot be an optimal donation. **QED**

Proof of Proposition 2: Suppose Proposition 2 were false and that for some h and associated $g^*(h)$, the level of decentralized giving \bar{g} was greater than or equal to $(1+h)g^*(h)$. Since $U_1 > 0$, $U_{11} < 0$, and $U_{12} \geq 0$, $\bar{g} \geq (1+h)g^*$ implies that the left-hand-side of (5) is at least as large as the left-hand-side of (7). This implies that the right-hand-side of (5) must be at least as large as the right-hand-side of (7) and since $h > 0$,

$$U_2(W_R - \bar{g}, N\bar{g}) \geq (1+h)U_2(W_R - (1+h)g^*, (1+h)Ng^*) > U_2(W_R - (1+h)g^*, (1+h)Ng^*).$$

On the other hand, $\bar{g} \geq (1+h)g^*$, $U_2 > 0$, $U_{22} < 0$, and $U_{12} \geq 0$ together imply

$$U_2(W_R - \bar{g}, N\bar{g}) < U_2(W_R - (1+h)g^*, (1+h)Ng^*)$$

and we have a contradiction. **QED**

Proof of Lemma 2: For a given match ratio h , each employee takes as given that each other employee will donate g^* and solves

$$\max_g U\left((W_R - g^*h) - g, (N-1)(1+h)g^* + (1+h)g\right),$$

with the first order condition

$$U_1(W_R - (1+h)g^*(h), N(1+h)g^*(h)) = (1+h)U_2(W_R - (1+h)g^*(h), N(1+h)g^*(h)).$$

For notational ease, we define $\tilde{g}(h) \equiv (1+h)g^*(h)$. Consider two match ratios, h^A and h^B , with $h^A > h^B$. Suppose in fact that

$$(1+h^A)g^*(h^A) \leq (1+h^B)g^*(h^B).$$

The first order conditions corresponding to match ratios of h^A and h^B are

$$U_1(W_R - \tilde{g}(h^A), N\tilde{g}(h^A)) = (1+h^A)U_2(W_R - \tilde{g}(h^A), N\tilde{g}(h^A)) \quad (\text{A2})$$

and

$$U_1(W_R - \tilde{g}(h^B), N\tilde{g}(h^B)) = (1+h^B)U_2(W_R - \tilde{g}(h^B), N\tilde{g}(h^B)). \quad (\text{A3})$$

The assumptions that $U_1 > 0$, $U_2 > 0$, $U_{11} < 0$, $U_{22} < 0$, $U_{12} \geq 0$ and the supposition that

$(1+h^A)g^*(h^A) \leq (1+h^B)g^*(h^B)$ when $h^A > h^B$, have the following contradictory implication:

The left-hand-side of equality (A2) is smaller than the left-hand-side of equality (A3), yet the right-hand-side of equality (A2) is greater than the right-hand-side of equality (A3). Thus

$(1+h)g^*(h)$ is strictly increasing in h .

QED

Proof of Proposition 6: (a) For this proof only, we introduce some additional notation, \hat{g} and g' . A socially conscious employee who does defect could still choose to give a non-matched donation of \hat{g} , where \hat{g} may be zero. Those employees remaining with firm S will make a donation of g' after the defection. Note that $g' = g'(\hat{g}, h)$ is a function of both \hat{g} and h . It is

straightforward to show that $g'_1(\hat{g}, h) \equiv \frac{\partial g'(\hat{g}, h)}{\partial \hat{g}} < 0$.

We first wish to show that defection will always occur unless h is specified as a function of the number of employees remaining at firm S . To establish this result we assume that h is fixed. The defector will then need to solve

$$\max_g U(W_R - g, (N-1)g'(g, h)(1+h) + g).$$

One feasible strategy for the defector is to donate an amount equal to $g^*(h)(1+h)$; i.e., to give what she would have given at her previous employment and to make up for the lack of a match personally. She uses the increase in her wages as a result of the defection to cover exactly what would have been the match at her old firm. In this event $g'(g^*(h)(1+h), h) = g^*(h)$ and the defector achieves the same level of utility that she achieved before defecting.

But this will not be the optimal donation for a defector to choose. The partial derivative of the defector's maximization problem evaluated at $\hat{g} = g^*(h)(1+h)$ is

$$\begin{aligned}
& -U_1(W_R - g^*(h)(1+h), Ng^*(h)(1+h)) \\
& + U_2(W_R - g^*(h)(1+h), Ng^*(h)(1+h)) \left[1 + (N-1)(1+h)g'_1(g^*(h), h) \right] \\
& < -U_1(W_R - g^*(h)(1+h), Ng^*(h)(1+h)) + U_2(W_R - g^*(h)(1+h), Ng^*(h)(1+h)) \\
& < -U_1(W_R - g^*(h)(1+h), Ng^*(h)(1+h)) + (1+h)U_2(W_R - g^*(h)(1+h), Ng^*(h)(1+h)) \\
& = 0.
\end{aligned}$$

She could achieve a higher level of utility by giving a lesser amount instead. Thus if all firms were socially responsible there would be an incentive for a new firm of type R to enter and offer a wage marginally less than W_R . By doing so, it could attract socially conscious employees away from type S firms and earn a higher profit than competing firms.

(b) Now consider a corporation which donates a fixed amount to charity. An employee will defect since her wage will be increased while the amount contributed by the firm to the charity will be unchanged: She can then donate privately to the charity and/or increase her private consumption. **QED**

Proof of Proposition 7: Assuming that all other employees remain with firm S , an employee currently working for firm S with a matching grant scheme will defect if and only if

$$Max_{g_i} U(W_R - g_i, (N-1)(1+h)g^* + g_i) > U((1+\Delta)W_R - (1+h)g^*, N(1+h)g^*). \quad (A4)$$

If a firm is committed to donating a fixed lump-sum $N\bar{g}_l$, and this amount will not be reduced if one of its employee defects, then the employee will defect if and only when

$$Max_{g_i} U(W_R - g_i, N\bar{g}_l + g_i) > U((1+\Delta)W_R - \bar{g}_l, N\bar{g}_l). \quad (A5)$$

Recall that \bar{g}_l is the optimal donation per employee under the lump-sum approach. As $\bar{g}_l = (1+h)g^*$, comparing inequalities (A4) with (A5), we see that the productivity gain Δ

necessary to preclude switching is smaller when the firm has a matching scheme than when it makes a fixed lump-sum donation. **QED**

Proof of Lemma 3: Lemma 2 has established that $(1+h)g^*(h)$ is increasing in h . Suppose $(1+h)g^*(h)$ reaches $(1+\Delta)W_R$ at a finite value of h . The employee is consuming zero of the private good and her entire marginal product is donated to the charity. At higher values of h the lower bound of zero on consumption of the private good remains binding. Now suppose $(1+h)g^*(h)$ does not reach $(1+\Delta)W_R$ at a finite value of h and that $\lim_{h \rightarrow \infty} (1+h)g^*(h) = B < (1+\Delta)W_R$. The first-order condition requires

$$\frac{U_1(W_R(1+\Delta) - (1+h)g^*(h), N(1+h)g^*(h))}{U_2(W_R(1+\Delta) - (1+h)g^*(h), N(1+h)g^*(h))} = (1+h). \quad (\text{A6})$$

Take the limit of both sides of (A6) as h approaches infinity. The limit of the left-hand side is a finite number, $\frac{U_1(W_R(1+\Delta) - B, NB)}{U_2(W_R(1+\Delta) - B, NB)}$, while the limit of the right-hand side is infinite. **QED**

Proof of Lemma 4: We first prove that $hg^*(h)$ is an increasing function of h . We prove this statement by contradiction. Suppose that $hg^*(h)$ were non-increasing in h over some range. Then $g^*(h)$ would have to be decreasing in h over that same range and this would imply that $g^*(h) + hg^*(h) = (1+h)g^*(h)$ was decreasing in h over that range. But this is impossible since $(1+h)g^*(h)$ is increasing in h from Lemma 2. Thus, $hg^*(h)$ must be everywhere increasing in h . From Lemma 3, Now, it is known that $\lim_{h \rightarrow 0} hg^*(h) = 0$, $\lim_{h \rightarrow \infty} hg^*(h) = (1+\Delta)W_R$ (implied by Lemma 3) and $hg^*(h)$ is increasing in h . Continuity ensures there exists a match ratio \bar{h} such that $\bar{h}g^*(\bar{h}) = \Delta W_R$. **QED**

Proof of Proposition 8: First, to ensure that regular employees working for type R firms do not switch to type S firms, we require that $\Delta W_R < hg^*(h)$, i.e., that the nominal pay at firm S is

lower than that at firm R . Now, consider the condition for socially conscious employees to stay with firm S . If a potential defector conjectures that all other socially conscious employees will stay with firm S and continue to give $g^*(h)$, she will not defect as long as

$$U(W_R(1+\Delta) - (1+h)g^*(h), N(1+h)g^*(h)) > \max_g U(W_R - g, (N-1)(1+h)g^*(h) + g). \quad (A7)$$

From Lemma 4, there exists an h which satisfies $hg^*(h) = \Delta W_R$. Let \bar{h} denote this particular match ratio. Given this match ratio, we have

$$\begin{aligned} & U(W_R(1+\Delta) - (1+h)g^*(h), N(1+h)g^*(h)) \Big|_{h=\bar{h}} = U(W_R - g^*(\bar{h}), N(1+\bar{h})g^*(\bar{h})) \\ & \equiv \max_g U(W_R - g, (N-1)(1+\bar{h})g^*(\bar{h}) + g(1+\bar{h})) > \max_g U(W_R - g, (N-1)(1+\bar{h})g^*(\bar{h}) + g) \end{aligned}$$

and inequality (A7) is satisfied. Thus socially conscious employees will not defect at the match ratio \bar{h} since for any given level of private good consumption, type S employees will enjoy a higher level of public good consumption if they stay at firm S . By continuity, there exists some $h > \bar{h}$ in the neighborhood of \bar{h} , such that $\Delta W_R < hg^*(h)$ and type S employees will not defect.

QED

Proof of Proposition 9: The utility of a socially conscious employee who remains with firm S is

$$\max_g U(W_R(1+\Delta) - hg^*(h) - g, (N-1)(1+h)g^*(h) + (1+h)g).$$

She will conjecture that if she moves to work for firm R , she will enjoy a utility level of

$$\max_g U(W_R - g, (N-1)(1+h)g^*(h) + g).$$

From Lemma 3, $\lim_{h \rightarrow \infty} (1+h)g^*(h) = (1+\Delta)W_R$: As the match ratio approaches infinity, her private good consumption will fall to zero if she stays with firm S and her utility at that level is $U(0, N(1+\Delta)W_R)$. If she does move from firm S to firm R , she will enjoy a higher wage of W_R and can choose to make no donation at all, i.e., she can achieve a utility level of at least $U(W_R, (N-1)(1+\Delta)W_R)$. Therefore a type S employee will always defect when the match ratio gets high enough.

QED

Appendix 2: Notes on the Empirical Analysis

1: Data

The employee matching grants data come from *HEP Development Services*: <http://hepdata.com> collected on May 18, 2010. The database includes corporations, professional service firms, and non-profit organizations which offer employee matching grants. Our empirical analysis assumes that these firms also had matching grants back to year 2005, as *HEP Development Services* does not indicate when the matching programs started. We merge this database with financial information collected from the Fundamentals Annual data files on *Compustat* for firms included in the ExecuComp database in 2009. Financial data are collected for fiscal years between year 2005 and 2009. To be included in the sample, firms must have a set of relevant financial information available, in particular, the number of employees, book value of assets, and the operating income before taxes and depreciation. We delete observations for a given firm in a given year if the firm's book value of equity is negative that year. After the screening procedure, we have 7,872 valid firm-year observations. Finally, we add the variable "Generous Giving", item "com-str-a", from the *KLD* data base.

Information on the *Fortune Magazine* "100 Best Places to Work for in America" can be found on the website: <http://money.cnn.com/magazines/fortune/bestcompanies/2010/>.

2: Variable Definitions and *Compustat* Codes

A firm's capital stock is measured by the book value of assets (*Compustat* code AT). Labor productivity is measured by pre-tax Operating Income before Depreciation (*Compustat* Code: OIBDP) divided by the reported number of the employees of a firm (*Compustat* Code: EMP). According to the *Compustat* manual, "the number of employees represents the number of company workers as reported to shareholders. This is reported by some firms as an average number of employees and by others as the number of employees at year-end. No attempt has been made to differentiate between these bases of reporting. If both are given, the year-end figure is used. This item includes: all part-time and seasonal employees and all employees of consolidated subsidiaries, both domestic and foreign, but it excludes consultants, contract workers and employees of unconsolidated subsidiaries." To achieve consistency in the treatment of data, we assume that the number of employees is reported as the number at year-end. Thus, the number of employees and the reported book value of assets are considered to be stock

variables and we use the average of the beginning and end-of-year values of capital and labor to explain that year's production.

Appendix 3: The Impact of Taxes on Donations

We reconsider employee matching grant schemes when corporate and individual donations are deductible at the respective corporate and personal rates. We first show that the Proposition 1 result that lump-sum corporate donations crowd-out individual employee donations continues to apply in the presence of corporate and personal taxation. To see this, denote the corporate and personal tax rates by τ_c and τ_p respectively. When the firm donates \bar{g} per employee to the charity the total amount of the public good is $N\bar{g}$ and employees are paid at a reduced rate of W_S . Because both salaries and donations are tax deductible at the corporate level, there is no difference in shareholders' after-tax profits provided $W_S = W_R - \bar{g}$. The utility of socially conscious employees is

$$U(W_S(1-\tau_p), N\bar{g}). \quad (A8)$$

If the firm chooses not to donate, the utility of socially conscious employees each donating g is

$$U((W_R - g)(1-\tau_p), Ng). \quad (A9)$$

Inspecting expressions (A8) and (A9), we see that for $g = \bar{g}$, socially conscious employees are indifferent to the source of a given per employee donation. Either way, they bear the same cost in terms of reduced private consumption.

The total tax burden remains the same whether the company or its employees donate a given total amount. For a regular firm whose employees donate, total per employee wage and donation-related taxes are

$$\tau_p(W_R - g) - \tau_c W_R.$$

For a socially responsible firm making a per employee donation of \bar{g} , total per employee wage and donation-related taxes are

$$\tau_p W_S - \tau_c(W_S + \bar{g}).$$

For $g = \bar{g}$ and $W_S = W_R - \bar{g}$, total wage and donation-related taxes are identical.

Finally we consider the impact of taxes on employee matching grant schemes. Because employees bear the cost of the corporate match in the form of lowered wages, socially conscious employees will defect to regular firms unless teams of socially conscious employees are more productive either in pecuniary terms or in producing a collective warm glow. A socially conscious employee at a type S firm who receives a wage of $W_S = W_R - hg^*(h)$ will solve

$$\max_g U\left((W_S - g)(1 - \tau), (N - 1)(1 + h)g^*(h) + (1 + h)g\right)$$

with an equilibrium first order condition of

$$\begin{aligned} & -(1 - \tau)U_1\left([W_R - (1 + h)g^*(h)](1 - \tau), N(1 + h)g^*(h)\right) \\ & + (1 + h)U_2\left([W_R - (1 + h)g^*(h)](1 - \tau), N(1 + h)g^*(h)\right) = 0. \end{aligned} \quad (\text{A10})$$

If she defects she will solve

$$\max_g U\left((W_R - g)(1 - \tau), (N - 1)(1 + h)g^*(h) + g\right).$$

Our defector could achieve her pre-defection utility level simply by making a post-defection donation of $(1 + h)g^*(h)$; i.e. by donating both $g^*(h)$ and enough to cover the lost employer match of $hg^*(h)$. The partial of the defector's utility with respect to her post-defection donation evaluated at $\hat{g} = (1 + h)g^*(h)$ is

$$\begin{aligned} & -(1 - \tau)U_1\left([W_R - (1 + h)g^*(h)](1 - \tau), N(1 + h)g^*(h)\right) \\ & + U_2\left([W_R - (1 + h)g^*(h)](1 - \tau), N(1 + h)g^*(h)\right) < 0. \end{aligned} \quad (\text{A11})$$

The inequality follows from a comparison of the left-hand sides of expressions (A10) and (A11). Thus a socially conscious employee can always increase her utility by defecting and choosing to donate an amount less than $(1 + h)g^*(h)$. Thus the Proposition 6 result that, all else equal, socially conscious employees will switch to regular firms offering higher wages will continue to apply in the presence of both corporate and personal taxes.

Table 1: Summary of U.S. Employee Matching Grant Programs**Panel A: Distribution of the maximum amount matched**

The number of organizations reported in the data source <http://hepdata.com> on May 18, 2010 as willing to match to a specific level when organizations are counted at the parent company level

Maximum Amount Matched	Number of Firms	%
50,000-200,000	8	0.44%
25,000-49,999	26	1.43%
10,000-24,999	174	9.54%
5,000-9,999	232	12.73%
1,000-4,999	653	35.82%
100-999	468	25.67%
20-99	14	0.77%
Unspecified	248	13.60%
Total	1823	100.00%

Panel B: The distribution of the match ratio

The maximum for each parent company organization reported in the data source <http://hepdata.com> on May 18, 2010 of that organization's regular and qualified match ratios:

Match Ratio	$h = 9$	$h = 5$	$h = 4$	$h = 3$	$h = 2$	$h = 1$	$h < 1$
Number of Firms	1	1	1	22	106	1607	85
%	0.05%	0.05%	0.05%	1.21%	5.81%	88.15%	4.66%

An organization with a matching scheme may specify different match ratios for donations made to different causes. For example, Murphy Oil Corporation has a matching policy which specifies that donations for Education & Hospitals will be matched as 2:1; other donations are matched 1:1. In this case, the regular match ratio is 1 and the qualified match ratio is 2. We report that such a company has a match ratio $h = 2$ in Panel B.

Table 2: Notation

Variables with a single asterisk (*) denote a setting with matching scheme rather than a lump sum scheme. Variables with the subscript l denote a setting with a lump-sum scheme.

<i>Variable</i>	<i>Definition</i>
W_R	Wage paid at a regular firm
W_S	Wage paid at a socially responsible firm
g_i	Employee-donor i 's contribution to the public good
N	The number of employees in a firm
h	Match ratio
x	Employee-donor's private consumption
G	Total donations to the public good
$U(x, G)$	Employee-donor's utility function
τ	Tax rate
Δ	The incremental labor productivity of socially conscious employees in team relative to the productivity of regular employees

Table 3: The relation between the optimal match ratio consistent with a separating equilibrium percentage and various model inputs

$W_R = 1000$ and $U(x, G) = x^\alpha G^\beta$ in all the panels.

Panel A: The relation between the optimal match ratio consistent with a separating equilibrium and the labor productivity increment of a team of socially conscious employees assuming that $\alpha = \beta = 0.5$ and $N = 100$

Δ	0%	0.5%	1%	1.5%	2%	2.5%	3%	3.5%	4%
H	0	0.515	1.020	1.525	2.030	2.535	3.040	3.545	4.050

If there is a 2% productivity gain associated with a team of socially conscious employees, the match ratio that maximizes employee utility and maintains a separating equilibrium is 2.03.

Panel B: The relation between the optimal match ratio consistent with a separating equilibrium and the number of employees of a socially responsible firm assuming that $\alpha = \beta = 0.5$ and $\Delta = 2\%$

N	25	50	75	100	125	150	175	200	225
h	0.562	1.04	1.533	2.030	2.528	3.026	3.523	4.025	4.524

Panel C: The relation between the optimal match ratio consistent with a separating equilibrium and the preference parameter α of socially conscious employees assuming that $\beta = 1 - \alpha$, $\Delta = 2\%$ and $N = 100$

α	0.3	0.35	0.4	0.45	0.5	0.55	0.6	0.65	0.7
h	0.894	1.111	1.365	1.667	2.030	2.473	3.028	3.741	4.694

Table 4: Summary Statistics
Matching Grants vs. Non-matching Grants

The sample consists of firms included in ExecuComp database in 2009. Matching grant information is obtained from www.hepdata.com for May 18, 2010. Financial information comes from Compustat and covers the years 2005 through 2009. Dollar values are deflated to 2005 dollars. The GDP deflator information comes from the website of the Federal Reserve Bank in St. Louis. Firm-year observations with incomplete financial information on Labor Productivity, Book Asset Value and Number of Employees or with negative book value of equity in a given year are dropped from the sample. N is the number of the firm-year observations. Panel A includes all firms. Missing values of R&D are assumed to have zero value. Panel B reports summary statistics for the subsample of firms with matching grants. Panel C reports summary statistics for firms without matching grants.

Panel A: All Firms

	N	Mean	S.D.	25%	Median	75%
Labor Productivity (thousands per employee)	7,872	93.76	369.53	17.62	40.74	97.46
Book Assets (millions)	7,872	15,055	89,561	602	1,856	6,391
No. of Employees (thousands)	7,872	19.78	66.70	1.50	4.79	14.60
Book Assets per Employee (thousands)	7,872	1,429	5,252	169	355	971
Tobin's Q	6,808	1.56	1.19	0.83	1.22	1.89
ROA	7,872	0.13	0.11	0.07	0.12	0.18
Book Leverage	7,872	0.20	0.17	0.05	0.18	0.31
R&D	7,872	0.06	0.70	0.00	0.00	0.03
Matching Dummy	7,872	0.28	0.45	0.00	0.00	1.00

Panel B: Firms with Matching Grants

	<i>N</i>	<i>Mean</i>	<i>S.D.</i>	<i>25%</i>	<i>Median</i>	<i>75%</i>
Labor Productivity (thousands per employee)	2,169	137.44	482.48	28.04	56.23	125.59
Book Assets (millions)	2,169	31,092	120,000	1,734	5,211	18,439
No. of Employees (thousands)	2,169	34.71	106.41	3.75	11.25	31.50
Book Assets per Employee (thousands)	2,169	1,628	6,387	219	451	1,220
Tobin's Q	1,909	1.49	1.13	0.80	1.20	1.86
ROA	2,169	0.14	0.08	0.09	0.13	0.19
Book Leverage	2,169	0.22	0.15	0.11	0.22	0.32
R&D	2,169	0.03	0.07	0.00	0.00	0.03

Panel C: Firms without Matching Grants

	<i>N</i>	<i>Mean</i>	<i>S.D.</i>	<i>25%</i>	<i>Median</i>	<i>75%</i>
Labor Productivity (thousands per employee)	5,703	77.14	314.62	14.22	35.75	87.57
Book Assets (millions)	5,703	8,956	75,698	460	1,247	3,859
No. of Employees (thousands)	5,703	14.10	41.46	1.13	3.59	10.00
Book Assets per Employee (thousands)	5,703	1,353	4,749	152	330	846
Tobin's Q	4,899	1.58	1.22	0.83	1.22	1.90
ROA	5,703	0.12	0.12	0.06	0.12	0.18
Book Leverage	5,703	0.19	0.17	0.03	0.17	0.30
R&D	5,703	0.07	0.82	0.00	0.00	0.03

Table 5
Labor Productivity and Matching Grants

Labor productivity is defined as pre-tax operating income before depreciation per employee. The dependent variable is the log of labor productivity. The independent variable of interest is a matching grant dummy variable (equal to one when the firm has a matching grant and zero otherwise) multiplied by the log of the number of employees. The other independent variables are the log of the number of employees and the log of the book value of assets per employee. The variable, “Generous Giving,” is the item “com-str-a” from the *KLD* data base. The regression results of the pooled ordinary least squares (OLS) are in Panel A, which includes a sector dummy variable based on GICS industry classification of each firm. The GLS estimates of Random Effects Panel Data Regressions are reported in Panel B. Dollar values of assets and profits are deflated to 2005 dollars. The *t*-statistics (in parentheses) are computed using standard errors robust to heteroskedasticity and clustering at the firm level. Significance is noted by *** at the 1% level, by ** at the 5% level and * at the 10% level.

Panel A. Pooled-OLS Regressions

	(1)	(2)	(3)	(4)	(5)	(6)
Matching×ln(emp)	0.0655 (5.371)***	0.0539 (4.047)***	0.0537 (4.008)***	0.0483 (4.502)***	0.0335 (2.916)***	0.0334 (2.905)***
ln(book assets/emp)	0.707 (47.26)***	0.712 (39.31)***	0.712 (39.03)***	0.797 (43.17)***	0.824 (33.12)***	0.824 (33.01)***
ln(emp)	−0.0686 (−5.269)***	−0.0332 (−1.987)**	−0.0345 (−2.043)**	−0.0593 (−4.751)***	−0.0162 (−1.046)	−0.0167 (−1.067)
H-index		0.596 (1.696)*	0.590 (1.682)*		−0.679 (−2.001)**	−0.680 (−2.004)**
G-index		−0.00485 (−0.696)	−0.00498 (−0.717)		−0.0124 (−2.092)**	−0.0125 (−2.101)**
lagged R & D		0.0908 (0.315)	0.0837 (0.290)		−0.108 (−0.352)	−0.111 (−0.362)
“Generous Giving”			0.0520 (0.561)			0.0200 (0.242)
Sector Effect	No	No	No	Yes	Yes	Yes
Observations	7,412	5,553	5,553	7,412	5,553	5,553
Adjusted R ²	0.677	0.663	0.663	0.728	0.727	0.727

Panel B. GLS Random Effect Regressions

	(1)	(2)	(3)	(4)	(5)	(6)
Matching*ln(emp)	0.0571	0.0468	0.0464	0.0439	0.0280	0.0278
	(4.390)***	(3.319)***	(3.289)***	(3.837)***	(2.356)**	(2.337)**
ln(book assets/emp)	0.709	0.713	0.712	0.781	0.816	0.815
	(46.05)***	(37.09)***	(37.01)***	(40.45)***	(33.70)***	(33.64)***
ln(emp)	-0.0556	-0.0119	-0.0128	-0.0515	0.00196	0.00121
	(-3.838)***	(-0.666)	(-0.716)	(-3.749)***	(0.120)	(0.0733)
H-index		-0.858	-0.862		-1.512	-1.514
		(-1.974)**	(-1.986)**		(-3.542)***	(-3.548)***
G-index		-0.00703	-0.00715		-0.0130	-0.0130
		(-1.063)	(-1.082)		(-2.238)**	(-2.255)**
lagged R & D		-0.376	-0.379		-0.441	-0.443
		(-1.659)*	(-1.668)*		(-1.859)*	(-1.865)*
“Generous Giving”			0.0512			0.0378
			(0.955)			(0.717)
Sector Effect	No	No	No	Yes	Yes	Yes
Observations	7,412	5,553	5,553	7,412	5,553	5,553
Overall R^2	0.677	0.660	0.660	0.728	0.726	0.726

Table 6
Matching Grants and “100 Best Companies to Work for” List

Panel A: The following table summarizes the frequency of appearance of firms with and without matching grant schemes in *Fortune Magazine*’s “100 Best Places to Work for in America” lists between 2006 and 2010 inclusive. There are 7,872 firm-year observations.

	Matching Grants	No Matching Grants	Total
On “100 Best” List	104 (4.79%)	77 (1.35%)	181
Not on “100 Best” List	2,065 (95.21%)	5,626 (98.65%)	7,691
Total	2,169	5,703	7,872

Panel B: The following table summarizes the frequency of appearance of firms with and without matching grant schemes in *Fortune Magazine*’s “100 Best Places to Work for in America” lists between 2007 and 2010 inclusive, if the firm was not on the list in the previous year. There are 6,023 firm-year observations.

	Matching Grants	No Matching Grants	Total
On “100 Best” List	22 (1.36%)	8 (0.18%)	30
Not on “100 Best” List	1,596 (98.64%)	4,397 (99.82%)	5,993
Total	1,618	4,405	6,023

Panel C: The following table summarizes the frequency of appearance of firms with and without matching grant schemes in *Fortune Magazine*’s “100 Best Places to Work for in America” lists between 2007 and 2010 inclusive, if the firm was in the list in the previous year. There are 150 firm-year observations.

	Matching Grants	No Matching Grants	Total
On “100 Best” List	62 (77.50%)	50 (76.92%)	118
Not on “100 Best” List	18 (22.50%)	15 (23.08%)	32
Total	80	65	150

Table 7
Matching Grants and “100 Best Companies to Work for” List:
Probit Regressions

The dependent variable takes the value of one if the firm appears in the “100 Best Places to Work for” list and zero otherwise. The independent variable is a dummy variable for matching grants, plus control variables for lagged labor productivity, log of book assets, log of the number of employees, *H*-index, *G*-index and lagged R&D. The variable, “Generous Giving,” is the item “com-str-a” from the *KLD* data base. Book value of assets and profits are deflated with the year 2005 GDP deflator. *z*-statistics are reported in brackets and standard errors are adjusted for clustering at the firm level.

	(1)	(2)	(3)
Matching Dummy	0.5464 (4.47)***	0.4783 (3.81)***	0.2983 (1.95)*
“Generous Giving”		0.7666 (3.72)***	0.6215 (2.62)***
Lagged labor Prod.			7.48e ⁻⁵ (1.62)
<i>Ln</i> (EMP)			0.0878 (1.36)
<i>Ln</i> (Book Assets)			0.0901 (1.50)
<i>H</i> -index			-2.1925 (-1.06)
<i>G</i> -index			-0.0271 (-1.10)
lagged R&D			0.2811 (2.09)**
# of observations	7,872	7,808	4,595
Pseudo <i>R</i> ²	0.0422	0.0619	0.1031