# Altruism and Occupational Choice*

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**Abstract**

Jobs are often valued not just for the wages they pay but also for the nature of the work and the outputs of the employer. We explore how altruism and social motivations shape choices about where to work. We consider workers who, acting on altruism, optimize work and consumption choices to maximize their contributions to society. They have two mutually exclusive options: a job with a high wage at a for-profit firm and a lower-paid job with a nonprofit. Working for the for-profit firm allows workers to maximize their financial contributions to the nonprofit ("earning to give"). Working at the nonprofit allows workers to donate their labor. While firms generally benefit when workers are motivated by more than wages, we show that the interests of socially-motivated workers and those of the nonprofit do not always align when workers' budget constraints bind. When workers feel "warm glow" from working for the nonprofit in addition to acting on purely-altruistic motivations, choices by workers with binding budget constraints are now more likely to align with the nonprofit's interests, but choices are also more likely to misalign for other workers.

# 1.    Introduction

In the standard theory of labor supply, workers first select jobs that offer the highest wages and then allocate their earnings to their wants and needs, including spending on supporting relatives, communities, or charities. In practice, however, workers face a broader set of choices. Rather than first maximizing income, some workers consider positions that permit helping others directly through their work (Todd 2016, Barigozzi and Burani 2019, Pryor and Mitchell 2015). Or, at an extreme, they may choose to "earn to give" by first making a personal commitment to give an amount to charity, and then finding a job that pays enough to fund the commitment (Singer 2015, MacAskill 2015). These decisions draw altruism and occupational choice together, and we bring the ideas to the labor market by considering a worker with pro-social motivations who faces a dilemma: whether to choose a regular job in a for-profit firm or a lower-paying job in a nonprofit. Working for the for-profit allows a larger financial donation, while working for the non-profit allows direct engagement with a cause and permits contributions of uncompensated effort. Our theoretical model translates an altruists' aim to combine gifts of time and money in a way that maximizes her contribution to society while ensuring decent living conditions for herself.

Recent analyses of labor markets show how the social motivations of workers can increase effort and productivity in nonprofits and socially-minded for-profits (see Besley & Ghatak, 2018, for an overview). By reducing agency problems, socially-motivated workers can be particularly valuable to these firms. We extend the framework by investigating whether and why socially-motivated workers choose to work for these firms, and when it is optimal from the firms' vantage for them to do so.

The analysis shows the importance of workers' budget constraints in shaping occupations. We begin by considering pure altruism, where workers gain utility directly from the output of a nonprofit. The model describes socially-motivated workers with binding budget constraints who have the greatest impact by working directly for the nonprofit (by donating time but not money), even though they earn a relatively low wage. But workers whose budget constraints do not bind have a larger opportunity set. For them, working for a for-profit firm and donating money (but not time) to the nonprofit can be a more efficient way to help their favored cause. As Mathews (2013) writes: "Join Wall Street. Save the World."

The depiction and the choice dilemma draw on the "effective altruism" movement in philosophy, which applies the economic principle of cost-effectiveness to the philanthropic

desire to do good (Singer 2015, MacAskill 2015, MacFarquhar 2015). Economists and effective altruists recognize two different motives for giving: pure altruism and warm-glow feelings (Francois and Vlassopoulos 2008). In pure altruism, the donor derives utility from the utility experienced by others (they get utility from the output of a charitable nonprofit in our model). In contrast, warm glow is typically associated with the donors' positive feelings about their own actions, as a direct benefit from the *act* of giving rather than from the impact of giving ("impure altruism", Andreoni 1989).[1] Both types of altruism apply to money and labor donations alike, and effective altruists advocate for a hard-headed approach to maximizing impact on the people served by charities. They argue for combining pure altruism with the careful selection of causes, in contrast to giving only motivated by the warm glow of feeling that one has done good (Singer 2015, MacAskill 2015).

In practice, not every altruist is willing to work on Wall Street. The presence of "warm glow" feelings may push against taking a job where money is the only bottom line, and we consider how the picture changes with impure altruism. Warm glow feelings reinforce the workers' choice to work for the nonprofit, which aids alignment between the nonprofit and workers with binding budget constraints (in the spirit of Andreoni 1990 and Besley and Ghatak 2005). But we show that warm glow feelings can lead to a misalignment for other workers. Warm glow induces these workers to give less money and instead work directly for the nonprofit in a way that can be suboptimal for the nonprofit. The social value of impure altruism thus depends largely on the workers' budget constraints and how the constraints shape occupational choice. In this way, we show a labor market analogue to findings of inefficiencies due to warm glow in experiments on charitable giving (Null 2011, Karlan & Woodson 2017).

Our model formalizes this key dichotomy by showing how budget constraints interact with separately parametrized degrees of pure and impure altruism of motivated workers. There is no general finding that "effective altruism" defined as decision-making driven by pure altruism only is, in principle, most effective for the nonprofits to be helped. The impact of altruism, via choices about giving money and time, depends on the form of altruism and the workers' contexts.

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[1] The classification proposed by Benabou and Tirole (2006) has three types of motivation: extrinsic, intrinsic and reputational. In the (im)purity parlance, only the intrinsic motivation is pure. In the case of labor donation to the public sector, Francois and Vlassopoulos (2008) use the terminology of "action-oriented" and "output-oriented" for impure and pure altruism, respectively.

## 2.    Evidence on Altruism and Labor Markets

Charitable giving is increasingly attracting scholarly attention (Evren & Minardi, 2017; Ottoni-Wilhelm et al., 2017; Karlan & Woodson, 2017; Kolm, 2014). One reason is that charitable giving is quantitatively important, especially in the United States. A Gallup survey found, for example that in 2017 Americans—as individuals, foundations, or firms—donated about $410 billion, or roughly 2.1% of US GDP (Clifton 2018). In other countries, the propensity to donate is even higher. *The World Giving Index 2018* (Charities Aid Foundation, 2018), shows that, as a percentage of the population, the highest-donating countries were Myanmar (88% reported donating in the prior month), Indonesia (78%), Australia (71%), the United Kingdom (68%), and New Zealand (68%). The comparable United States figure is 61%.

People also donate time. For example, The US Corporation for National and Community Service, a federal agency, reports that 77 million US adults (30% of the total) formally volunteered in 2017 (i.e., via an established organization), aggregating to nearly 6.9 billion hours (CNCS 2018).[2] The US non-profit sector is also a large employer. In 2017, for example, nonprofits accounted for 12.5 million jobs, or 10.2% of all private sector employment in the United States (BLS 2019).[3] Worldwide nonprofit institutions account for 4.5% of GDP and 7.4% of total workforce on average (Salamon et al. 2012).[4]

Working for a nonprofit, though, may not necessarily be altruistic, and nonprofit jobs do not always pay less than other jobs. Still, organizations driven by social missions are most likely to be nonprofits. The US Bureau of Labor Statistics reports particularly large wage gaps for professionals and managers, for example: The 2007 National Compensation Survey shows that non-profit professionals and managers earned an average of $34.24 per hour versus $41.86 per hour for workers working for for-profit firms—a wage gap of 18 percent (Butler, 2009). Leete (2001) and Ruhm and Borkoski (2003), however, argue that most nonprofit jobs in the US do not pay lower wages than for-profit jobs once worker attributes are considered.

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[2] The data were collected through a supplement to the US Current Population Survey. CNCS values the time at an estimated $167 billion using an opportunity cost of $24.14 per hour calculated by Independent Sector, a membership organization for nonprofits and charitable organizations. (https://independentsector.org/news-post/value-volunteer-time/). More conservatively, valuing the 6.9 billion hours at the federal minimum wage in 2017 ($7.25 per hour) yields a total value of $50 billion.

[3] The Bureau of Labor Statistics (2019) data are from The Quarterly Census of Employment and Wages and the Internal Revenue Service Exempt Organization Business Master File.

[4] Data for GDP and workforce cover 15 and 13 countries for which data are available, respectively.

Looking across all sectors, the ratio of wages in nonprofits to for-profits is 0.97 overall, indicating a very small average wage gap (BLS 2019). The BLS data show that in some sectors, the wage ratio favors nonprofits (for example, the ratio is 1.37 for "Colleges, Universities, and Professional Schools" as a sector), and in other it favors for-profits (0.54 for "Management of Companies and Enterprises"). In the latter case, average weekly pay across all establishments in the sector is $2305, while it is just $1330 for non-profit employees. From the standpoint of occupational choice and altruism, however, the issue for workers may not hinge on whether comparable jobs pay similarly but whether it's possible to move into a completely different occupation in the for-profit sector (working as a well-paid analyst at an investment bank, say) versus working in a hands-on job in a nonprofit at a lower wage (eschewing banking to teach math in an under-performing high school).

Why do workers choose positions at nonprofits despite lower pay? One reason for the wage gap is that non-monetary job attributes create compensating differentials that balance against the higher wages available elsewhere (Benz 2005, Brown *et al.* 2018). Non-monetary attributes include "work as a source of meaning" (Cassar & Meier 2018). A second reason is that job responsibilities and required skills might differ.[5] We focus on a third reason for the wage differential: labor donation. Workers seeking to support the mission of the nonprofit may work without full compensation as a way to transfer resources to the nonprofit (Preston, 1989; Shahrier & Kotani, 2014). These workers may not necessarily particularly enjoy the job, but they choose to support the nonprofit's mission by giving their time and effort.

Broadly along these lines, Dur and van Lent (2019) use a survey of more than 100,000 workers in 47 countries (collected as part of the International Social Survey Program, Work Orientations Waves in 1989, 1997, 2005, and 2015) to show that about 25 percent of respondents see their job as "socially useless" or believe it could be. Most workers in the survey report wanting a socially useful job and report suffering when their job seems socially useless.

### 2.1. *Motivated Workers*

Economists are increasingly interested in the implications of agents with pro-social motivations. In labor market theory, altruistic agents are typically represented as workers in the public sector, with which they share an intrinsic social objective (Dixit, 2002; Serra et al., 2011).

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[5] Similarly, wages may reflect unobserved productivity. Workers in nonprofits may be intrinsically less productive due to unobserved qualities or weaker monitoring technologies, or employers in the private sector may be more willing to pay efficiency wages. Both features would drive a wedge between wages in the two sectors.

In a lab experiment with 1,700 students in Indonesia, Banuri and Keefer (2016) observe that greater pro-social motivation is associated with greater effort, greater interest in public occupations, and lower attraction to high-pay jobs. Without motivational inspiration, workers aim for higher pay (Carpenter & Gong, 2016). Overall, the experimental results suggest that when the pro-social motivation of an employee is satisfactorily met by her employer, workers can feel they receive a non-pecuniary compensation. Pro-social motivation also explains why, despite low-powered incentives, the public sector often supplies services of good quality (Ma, 2007).

In line with the evidence, theoretical models of occupational choice build on the assumption that agents work harder when they are motivated by the mission of the organization they serve (Besley & Ghatak, 2005, 2017, 2018). The underlying reason is that workers value the output of pro-social organizations, which is often framed as a public good. Yet, employer-employee matching can be imperfect in equilibrium due to information asymmetries. Delfgaauw and Dur (2008) develop a model where workers are either "regular," "lazy," or "motivated." Lazy workers are characterized by having a high cost of effort while motivated workers lean toward working in the public sector (Delfgaauw & Dur, 2007). Delfgaauw and Dur (2008) show that, in equilibrium, if effort is unverifiable, the public sector risks attracting lazy workers, who may crowd out motivated workers when the public sector is small.

The literature recognizes that the motivation of workers in public services stems from various sources beyond wages (Perry and Wise 1990; Francois 2000; Dal Bó et al 2013; Cassar and Meier 2018; Dur and van Lent 2018 and 2019). In addition to the public sector, intrinsically attractive jobs can be found in organizations with varying legal statuses, such as charities and social enterprises. As emphasized by Besley and Ghatak (2005), mission-oriented organizations typically rely on a workforce motivated by the organizations' work. Matching social preferences increases both the firm's efficiency and the worker's utility. Gerhards (2015) and Carpenter and Gong (2016) confirm with experimental evidence that the matching of the workers' altruistic preferences and the organization's mission is a key driver of motivation. Recent experimental evidence by Cassar (2019) suggests that employers can use prosocial missions for reducing monetary incentives to the workers but, more surprisingly, missions matched to the worker's interest and random missions have similar impacts.

The type of altruistic motivation matters when framing a model of occupational choice. Altruism can be either pure or impure (Andreoni 1989, Francois and Vlassopoulos 2008), and

it can originate either from a general interest in "helping others" (generalist altruism) or from the dedication to a specific cause (effective altruism). Pure altruism can be crowded out by government subsidies (Andreoni, 2019) while the notions of warm glow and impure altruism help explain how large charities such as the Red Cross survive.[6] Theoretical models deal with both pure and impure altruism, but they typically assume that workers' motivation stems from generalist altruism. By contrast, models addressing charitable giving are likely to consider agents seeking to further a specific cause, and therefore they pay special attention to the alignment between the agent's cause and the organization's mission.[7]

Misalignment can have perverse effects, such as the "mixed feelings" generosity described by Konow (2010). The effective-altruism approach, based on a strict selection of cost-efficient recipient organizations (Singer 2015), is in tune with models underscoring the perverse consequences of misalignment (Besley and Ghatak, 2005).

## 2.2. Cash vs. Labor Donations

A related literature considers donations and volunteer labor (e.g., Brown and Lankford, 1992; Andreoni et al., 1996; Brown et al., 2018; Bauer et al., 2013), investigating the relationship between donating money and volunteering time. The two types of donations (money and time) are typically studied separately, but a few recent papers lift the veil on the issue (Charness et al., 2016; Brown et al., 2018; Dur and van Lent 2018).

Charness et al. (2016) compare experimentally the effects on workers' productivity of pro-social incentives vs. financial incentives. The results show that the workers' attitude varies with the size of the amount involved: highly incentivized workers are more productive when earning the personal bonus instead of giving it to a charity, but the reverse is observed with low incentives. The lab evidence in Brown et al. (2018) shows that people prefer giving labor over giving the equivalent amount of money, suggesting that labor donations generate greater warm glow than cash donation.

Closer to our concern, Dur and van Lent (2018) develop a model where the agents combine the dual occupational choices of 1) taking a public vs. private job and 2) how much effort they exert, and 3) how much of their income they give to a charity. The private sector pays a flat wage while the private sector provides performance-based compensation. When the

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[6] Fraser (2018) suggests that religious motives help explain some altruistic donations that are less easy to explain solely with impure altruism and warm glow, such as private transfers for poverty alleviation.
[7] This output-based approach is close to what Glazer (2004) calls "devotion" to the job.

labor market is perfectly competitive, labor donation (i.e. taking a public job) and money donations are perfect substitutes, creating a trade-off for motivated workers. Under these assumptions, their model shows that a higher level of altruism increases the likelihood of preferring a public job and, for a given job, increases the cash donation.

We focus instead on the problem faced by effective altruists who maximize the output of a unique pro-social firm. Effective altruists are ready to work for a for-profit firm and contribute through cash donations only if this is in line with the productive strategy for the nonprofit they care about. Otherwise, they would rather donate as much money as they can. In this framework, labor donation and money donations are not necessarily perfect substitutes. The intensity of the trade-off depends on the production technology used by the nonprofit and the budget constraint of the worker.

### 3.    Model Setup

We start with an altruist who wants to use her resources to support a particular nonprofit aligned with her preferences. She could seek a for-profit job that pays well and allows her to make substantial charitable donations to the nonprofit, or she could work for the nonprofit directly (Todd 2016). If she works for the nonprofit, she is more productive than other workers, so her labor donation is relatively valuable, but it comes with opportunity costs. As a "motivated" worker, she is intrinsically motivated by the chance to contribute to the organization's mission. Akerlof and Kranton (2000) develop a theory of identity that provides foundations for worker motivation along these lines, and Besley and Ghatak (2005) explore how the presence of motivated workers can relax principal-agent problems. Ashraf *et al.* (2015) use a randomized trial to show how the hiring of motivated workers affects productivity more strongly than wage incentives (in their case, career motivations dominate social motivations).

The question here is why some altruistically motivated workers prefer to work directly for nonprofits while others prefer to work in for-profit firms and make cash donations to nonprofits. To pick an extreme example, why do Bill and Melinda Gates choose to run their foundation themselves, while Warren Buffet focuses on investing and gives away billions?

Motivated workers are joined in the labor market by "regular" workers. Regular workers are defined here in the specific sense that they do not derive utility from the output of the non-

profit. They are as productive and hard-working as "motivated" workers when working in the private sector.

***Firms.*** There are a given number of firms actively hiring in the same competitive labor market: one is a nonprofit (NP) firm, and the others are for-profit (FP) firms. The FP firms are standard profit-maximizing firms. In contrast, the nonprofit distributes its output for free to those in need. It is able to produce thanks to an exogenous subsidy $S$, and endogenous labor and cash donations. Its production function is:

$$Q = f(K), \quad f' > 0. \tag{1}$$

where $Q$ is output and $K$ is capital.

The nonprofit hires a single worker. The for-profit firm pays the market wage $w_{FP}$ to their workers, while the nonprofit pays wage $w_{NP}$, where $w_{NP} \leq w_{FP}$. Why would a regular (non-motivated) worker ever take a non-profit job? We assume that they enjoy non-pecuniary benefits from non-profit employment, although, unlike pure altruists, regular workers do not gain utility directly from the non-profit's output. This critical distinction simplifies the model and allows us to focus on the decisions of motivated workers (Özgür & Minardi, 2017). The benefits received by regular workers provide a compensating wage differential, and wages are set so that regular workers are indifferent between employment in the two sectors.

The compensating wage differential is such that the wage gap between the for-profit and non-profit sector is exactly offset by the non-monetary compensation. Therefore, $w_{NP}$ can be considered as the market wage for the worker working with the nonprofit. We denote by $\delta$ the corresponding wage gap:

$$\delta = w_{FP} - w_{NP} \geq 0$$

***Workers.*** There are two types of workers in the market. As above, regular workers are indifferent between the two types of firms since the non-monetary compensation counteracts the wage gap. In contrast, the motivated worker *really* cares about nonprofit's output. Her utility $U$ depends on personal consumption $C$, the nonprofit's output $Q$, and whether she works directly for the nonprofit (captured by the indicator variable $I_{NP}$). To work with explicit expressions, we assume that the motivated worker has a separable logarithmic utility function which is the log-equivalent to Cobb-Douglas utility:

$$U_M(C, Q, I_{NP}) = U(C, Q) + c\, I_{NP} = \ln C + b \ln Q + c\, I_{NP}, \quad b > 0, c \geq 0 \tag{2}$$

where $I_{NP}$ is a binary variable taking value one when the motivated worker works with the NP:

$$I_{NP} = \begin{cases} 1 & if \ NP \ firm \\ 0 & if \ FP \ firm \end{cases}.$$

The utility function allows for both pure and impure altruism, in line with the experimental evidence of Lilley and Slonim (2014).[8] The coefficient $b$ captures the degree of pure altruism derived from the output of the nonprofit firm, and the coefficient $c$ represents the sensitivity to warm glow (or impure altruism) from choosing a "compassionate career" (using the language of Pryor and Mitchell 2015). In the analysis below, we start by focusing on pure altruism and then add impure altruism.

We assume no special link between the wage differential, $\delta$, and sensitivity to warm glow, $c$. Effective altruists may actively put aside their warm glow feelings in making choices, for example. Since the motivated worker especially cares about the output of the nonprofit, she could be willing to work with the for-profit firm instead, if it means that she could earn substantially more money to donate to the nonprofit. This is the idea underpinning the tenets of the "earning to give" principle, which as Muyskens (2017) puts it, is the ascetic "other half of effective altruism" that complements the search for cost-effective charities.

We deliberately focus on warm glow from *doing* not from *giving*. Specifically, we restrict warm glow to utility derived from the choice to work for the non-profit (see, e.g., Perry and Wise 1990; Francois 2000; Dal Bó et al 2013; Cassar and Meier 2018; Dur and van Lent 2018), not from the act of donating to it (as in, e.g., Warr, 1982; Null 2011; Ottoni-Wilhelm et al., 2017). Mechanically, this kind of warm glow tilts motivated workers toward working for the charity. We could instead introduce warm glow from both doing and giving, but the simplification here helps to show tensions and trade-offs between outcomes under pure versus impure altruism. Adding warm glow from giving would dampen the results below but would keep the results qualitatively similar provided that warm glow from doing is greater than that from giving, as in Brown et al. (2018). We assume that working for an anti-malaria charity has a stronger impact on one's psyche than solely donating money to the charity.

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[8] A different picture emerges from the results of the field experiment run by Tonin and Vlassopoulos (2010) where students can exert effort in an environment where both pure and impure altruism are elicited. The subjects fail to show any sensitivity to pure altruism, while women only made an effort when guided by warm glow feelings. No significant altruistic effort was observed for the male students. The gender gap in responsiveness to social incentives is confirmed in Tonin and Vlassopoulos (2015).

***Labor and Cash Donations.*** A motivated worker employed by the nonprofit is paid a wage $\widetilde{w_{NP}} \leq w_{NP}$. As above, she has two—combinable—ways of expressing her motivation toward the non-profit: by giving time (labor donation) and by giving money (cash donation). Her labor donation $V$ is the wage sacrifice made with respect to working with the for-profit firm, represented in terms of the wage differential with respect to the for-profit wage $w_{FP}$:

$$V = w_{FP} - \widetilde{w_{NP}}.$$

This sacrifice can take the form of either partial volunteering, or increased productivity without compensation (Gregg et al., 2011). By assumption, we have:

$$V \geq \delta \; = \; w_{FP} - w_{NP}. \tag{3}$$

The motivated worker's total income is the sum of her wage ($w_{FP}$ or $\widetilde{w_{NP}}$, depending of her employer) and her non-labor income $y$ (Menchik & Weisbrod, 1987).

The nonprofit's production function is assumed to be:

$$f\,(K) = K^a \quad a \geq 0. \tag{4}$$

The workers' cash and labor donations increase production via the firms' budget constraint. The motivated worker has the opportunity to make a cash donation to the nonprofit regardless of which firm she's working with. As a result, the nonprofit firm collects a donation, *D,* from the motivated worker. If the motivated worker instead selects a job with the for-profit firm and thus earns a higher wage, she can make an even larger donation to the nonprofit.

***The Nonprofit Firm's Problem.*** According to its social mission, the nonprofit firm maximizes output $Q \; = \; K^a$ under a budget constraint that depends positively on exogenous subsidy and the cash donation from the motivated worker and negatively on wages:

$$K = \begin{cases} S - \widetilde{w_{NP}} + D & \textit{if altruistic worker} \\ S - w_{NP} + D & \textit{if regular worker} \end{cases} \tag{5}$$

Note that the budget does not directly depend on the type of worker hired by the nonprofit. However, indirectly it does since donation $D$ depends on the wage—and thus the employer—of the motivated worker. From Eq. (4), the objective function of the nonprofit can be written:

$$Q = \begin{cases} (S - \widetilde{w_{NP}} + D)^a & \textit{if altruistic worker} \\ (S - w_{NP} + D)^a & \textit{if regular worker} \end{cases} \tag{6}$$

In either case, the nonprofit pays a lower wage than its for-profit counterpart, either because of non-monetary benefits (if a regular worker) or because of labor donation (if a motivated worker). We assume that:

$$S > w_{NP}(\geq \widetilde{w_{NP}}). \tag{7}$$

Under this technical condition, the nonprofit can afford to pay its worker's wage regardless of the size of the cash donation.

***The Motivated Worker's Problem.*** The motivated worker makes three joint decisions: where to work (labor donation), how much to give (cash donation), and how much to consume. The choices are formalized as follows: 1) the binary job choice between the for-profit firm or the nonprofit, 2) the amount $D$ donated to the nonprofit, and 3) the consumption level, $C$. The motivated worker maximizes utility $U_M(C, Q, I_{NP})$ under the budget constraint:[9]

$$y + w - D = C \tag{8}$$

where

$$w = \begin{cases} w_{FP} & if\ her\ employer\ is\ the\ for-profit\ firm \\ \widetilde{w_{NP}} & if\ her\ employer\ is\ the\ nonprofit \end{cases} \tag{9}$$

We solve this problem in two steps. First, we derive the optimal values of $D$ and $C$ for the motivated workers employed by the FP firm and the nonprofit, respectively. Then, we compare the two optimal utilities to determine the worker's choice of employer.

Ultimately, the decisive job choices are made by motivated workers since the regular workers are indifferent between the two types of firms. Beyond maximizing profit (for-profit firm) or output (nonprofit), we assume that the two firms are passive. Henceforth, the situation where the motivated worker opts for the nonprofit is referred to as the *compassionate-career case*, whereas the other combination where the motivated worker goes with a for-profit firm is called the *earning-to-give case*.

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[9] If donations are tax-deductible (rate $\theta$) the constraint becomes: $y + w - (1 - \theta)D = C$.

## 4. Pure Altruism

### 4.1. The Compassionate-Career Case

We first consider the case of the motivated worker who works for the charitable nonprofit. In the model here, the motivated worker's utility is linked to the nonprofit's productivity, which in turn depends on the type of worker that this firm has hired. The motivated worker knows that if she opts to work for the for-profit firm, the nonprofit will end up with a regular worker.

When the motivated worker takes the job with the nonprofit, the regular worker is irrelevant to our problem, and we have:

$$Q = (S - \widetilde{w_{NP}} + D)^a. \tag{10}$$

The motivated worker's problem is then:

$$Max\ U(C, Q) + c \qquad \text{s.t.}\ \ C = y + \widetilde{w_{NP}} - D \tag{11}$$

This model has features of the standard two-good consumption model, where output $Q$ acts as a second consumption good (besides actual consumption $C$). However, an important difference comes from the fact that part of the total budget—namely wage $\widetilde{w_{NP}}$—has a direct and negative impact on the quantity of the "second good." For the rest, the problem is standard, and optimization will determine the optimal quantity consumed of the "second good" *via* optimal donation $D$.

*Ex ante*, the total impact of the non-profit wage $\widetilde{w_{NP}}$ on utility is ambiguous because there is a trade-off. On one hand, a higher $\widetilde{w_{NP}}$ increases the budget of the motivated worker; on the other, it reduces the budget of the nonprofit. The optimization will establish which impact dominates.

The motivated worker maximizes:

$$U(D) = \ln[y + \widetilde{w_{NP}} - D] + b\,a\ln[S - \widetilde{w_{NP}} + D] + c \tag{12}$$

Let us assume for the moment that the non-negativity conditions are fulfilled. The first order condition is:[10]

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[10] This result does not hold for $b = 0$ (regular worker) because then we then have a corner solution $D^* = 0$ (no interior solution since $\ln C$ is decreasing with respect to $D$)

$$- (S - \widetilde{w_{NP}} + D) + ba[y + \widetilde{w_{NP}} - D] = 0. \tag{13}$$

It follows that:

$$D^* = \widetilde{w_{NP}} + \frac{-S+bay}{1+ba} = w_{FP} - V + \frac{-S+bay}{1+ba} \tag{14}$$

The optimal cash donation depends positively on wage $\widetilde{w_{NP}}$. However, we have:

$$\frac{\partial D^*}{\partial V} = -1, \tag{15}$$

which means that any extra dollar provided as a labor donation reduces the cash donation by the same amount. Labor donation and money donation interact as substitutes here (although the nature will generally depend on the nature of budget constraints and technical parameters).

The nonprofit's optimal output is:

$$Q^* = (S - \widetilde{w_{NP}} + D^*)^a = \left( \frac{ba(y+S)}{1+ba} \right)^a \tag{16}$$

This implies that:

$$\frac{\partial Q^*}{\partial V} = 0. \tag{17}$$

This optimal output does not depend on the wage the nonprofit is paying to the motivated worker. This is the direct consequence of Eq. (15) stating that any increase in labor donation translates into a same-size decrease in cash donation.

Last, the motivated worker's optimal consumption is:

$$C^* = \frac{S+y}{1+ba} \tag{18}$$

and:

$$\frac{\partial C^*}{\partial V} = 0. \tag{19}$$

Not surprisingly, the labor donation has no impact on the consumption of the motivated worker in the compassionate-career situation. The optimal cash donation makes both $Q^*$ and $C^*$ insensitive to labor donation. Hence, the wage of the motivated worker employed by the

nonprofit does not affect her utility.[11] Provided that her non-labor income is sufficient to produce an interior solution to utility maximization, the motivated worker might as well accept a zero wage.[12] This is clearly unrealistic as a general proposition but applies in some extreme cases (e.g., to Bill and Melinda Gates).

As expected, cash donations increase with $y$, the worker's non-labor income, and we have:

$$0 < \frac{\partial D^*}{\partial y} = \frac{ba}{1+ba} < 1 \tag{20}$$

The motivated worker shares her non-labor income with the nonprofit. She donates proportion $\frac{ba}{1+ba}$ for production and keeps the remaining fraction $\frac{1}{1+ba}$ for consumption. The donated fraction increases with both the motivated worker's degree altruism ($b$) and her productivity ($a$).

Interestingly, optimal donation $D^*$ depends negatively on $S$, the external subsidy received by the nonprofit:

$$-1 < \frac{\partial D^*}{\partial S} = -\frac{1}{1+ba} < 0. \tag{21}$$

As a consequence, the motivated worker's consumption depends positively on this subsidy. When the nonprofit has more external subsidy, the motivated worker does not need to donate as much money to ensure that the nonprofit can generate a given level of output. Existing subsidies thus allow motivated workers to give less money to charities, and so increase their own consumption. The subsidy provider produces a positive externality on the utility of the individuals who share the social concern of the nonprofit. Interestingly, $Q^*$, the nonprofit's output at the motivated worker's optimum, is proportional to $C^*$, the optimal consumption of this worker. This perfectly aligns the motivated worker's two objectives. The coefficient of proportionality is $b > 0$, the worker's degree of altruism.

Until now, we have disregarded the non-negativity restrictions. In sum, when non-negativity restrictions do not bind, we have:

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[11] The utility function here is quite standard and simplifies results. A more general specification would deliver similar trade-offs, but with more interactions.

[12] We exclude tax deductions here. If cash donations were deductible, the tax deduction would work as a "utility machine" since the altruistic worker could turn tax benefits into output and consumption.

$$D^* = \widetilde{w_{NP}} + \frac{-S+bay}{1+ba} \tag{22a}$$

$$C^* = \frac{S+y}{1+ba} \tag{22b}$$

$$Q^* = \left(\frac{ba(y+S)}{1+ba}\right)^a = (ba\,C^*)^a \tag{22c}$$

Equation (22a) shows that the exogenous subsidy $S$ has a negative impact on the optimal cash donation $D^*$. This impact is reminiscent of the crowding-out effect implied by pure altruism. When donors are motivated by the nonprofit's output only, their incentive to donate decreases with donations made by others (Warr, 1982; Ottoni-Wilhelm et al., 2017).

We now add the non-negativity restrictions to the picture. In fact, Eqs. (22b) and (22c) show that $C^*$ and $Q^*$ are always non-negative. But from Eq. (22a) it appears that for some parameter configurations, $D^*$ can be negative. Intuitively, these configurations happen when the motivated worker is not wealthy enough to insure her basic consumption needs *and* make a cash donation (on top of labor donation). In other words, when the non-negativity constraint binds, the optimal cash donation is zero and the motivated worker's consumption depends on her wage. Such a "labor-only donation" typically arises when the motivated worker has low non-labor income *y*, and/or when the nonprofit wage is low, and/or when the nonprofit is highly subsidized. The impact of a high subsidy is increased by the productivity of the motivated worker (her labor donation) and mitigated by her level of altruism (her willingness to donate).

Taking account of the non-negativity restrictions yields the following Proposition for the compassionate-career situation.

**Proposition 1:** The optimal strategy for the motivated worker in the compassionate-career situation is given by:

$$D^*_{CC} = Max\,\{0, D^*\}$$

$$C^*_{CC} = \begin{cases} \frac{S+y}{1+ba} & if\ D^* > 0 \\ y + \widetilde{w_{NP}} & if\ D^* = 0 \end{cases}$$

$$Q^*_{CC} = \begin{cases} \left(\frac{ba(y+S)}{1+ba}\right)^a = (ba\,C^*_{CC})^a & if\ D^* > 0 \\ (S - \widetilde{w_{NP}})^a & if\ D^* = 0 \end{cases},$$

where $D^* = \widetilde{w_{NP}} + \frac{-S+bay}{1+ba}$.

### 4.2. The Earning-to-Give Case

Warren Buffet has given billions of dollars to charity, but he has kept his focus on investing through Berkshire Hathaway, his for-profit company. He's fortunate that Bill and Melinda Gates (and other motivated people) run the charities which he supports. We consider the case in which the nonprofits would instead have to hire a non-motivated worker.

When the nonprofit hires a regular worker, the nonprofit's production function is given by:

$$Q = (S - w_{NP} + D)^a \tag{23}$$

Meanwhile, the motivated worker gets her wage from the for-profit firm, and her problem becomes:

$$Max\ U(C, Q) \qquad \text{s.t.}\ C = y + w_{FP} - D \tag{24}$$

or equivalently:

$$U(D) = \ln[y + w_{FP} - D] + ba \ln[S - w_{NP} + D] \tag{25}$$

Her first order condition is:

$$-(S - w_{NP} + D) + b\,a[y + w_{FP} - D] = 0$$

Ignoring the non-negativity conditions, we obtain:

$$D^* = \frac{-(S - w_{NP}) + ba(y + w_{FP})}{1 + ba}$$

Substituting for the for-profit wage $w_{FP} = w_{NP} + \delta$, we have:

$$D^* = w_{NP} + \frac{-S + ba(y + \delta)}{1 + ba}$$

The wage gap $\delta$ acts like an extra amount of non-labor income. The motivated worker donates share $\frac{ba}{1+ba}$ of the sum of the two quantities to the nonprofit and keeps the remaining share ($\frac{1}{1+ba}$) for her own consumption. In sum, when non-negativity restrictions do not bind, the optimal donation, output and consumption are given by:

$$D^* = w_{NP} + \frac{-S + ba(y + \delta)}{1 + ba} \tag{26a}$$

$$C^* = \frac{S+y+\delta}{1+ba} \tag{26b}$$

$$Q^* = \left(\frac{ba(y+S+\delta)}{1+ba}\right)^a = (ba\ C^*)^a \tag{26c}$$

Again, the nonprofit wage is irrelevant to the motivated worker's consumption and to the nonprofit's output. However, the wage gap matters. Indeed, the extra money brought by working with the for-profit firm makes it possible to give a higher donation to the nonprofit.[13] Like for $D^*$ in Equation (22a), we observe a crowding-out effect due to the negative impact of external subsidy $S$ on the worker's donation $D^*$. In addition, the derivative is the same in both cases $\left(\frac{-1}{1+ba}\right)$, which shows that the intensity of the crowding-out effect observed for money donations is not affected by the occurrence of labor donation.

As in the compassionate-career situation, the motivated worker is better off when their favored nonprofit is already highly subsidized. (This could explain why Warren Buffet finances the Gates Foundation rather than a smaller charity. His marginal utility of donation is higher when he donates to a charity that is already largely funded by others.)

When the non-negativity restrictions are taken into account, we obtain the following proposition.

**Proposition 2:** The optimal strategy for the motivated worker in the earning-to-give situation is given by:

$$D_{ETG}^* = Max\ \{0, D^*\}$$

$$C_{ETG}^* = \begin{cases} \frac{S+y+\delta}{1+ba} & if\ D^* > 0 \\ y + w_{NP} + \delta & if\ D^* = 0 \end{cases}$$

$$Q_{ETG}^* = \begin{cases} \left(\frac{ba(y+S+\delta)}{1+ba}\right)^a & if\ D^* > 0 \\ (S - w_{NP})^a & if\ D^* = 0 \end{cases},$$

where $D^* = w_{NP} + \frac{-S+ba(y+\delta)}{1+ba}$.

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[13] If cash donations are deductible, this effect is even stronger.

## 4.3 Occupational Choice and the Nonprofit's Preferences

In the earning-to-give situation, there is no labor donation. Thus, if the motivated worker fails to earn sufficient income to make a cash donation, she gives nothing to the nonprofit even though she is motivated and gains utility from its output. Intuitively, this no-donation situation is less prevalent than in the compassionate-career case since the motivated worker gets a higher wage with the FP firm. Likewise, one expects that, all other things equal, the cash donation is higher in the earning-to-give situation than in the compassionate-career situation. The next proposition formalizes this idea.

**Proposition 3:** The optimal donation in the earning-to-give case is not smaller than in the compassionate-career case: $D^*_{ETG} \geq D^*_{CC}$.

**Proof:** see Appendix A.

Thanks to the inequality in Proposition 3, we can label the three parameter configurations relevant for future comparisons as the "low budget" $\left( w_{FP} \leq \frac{-S+ba\,y-\delta}{1+ba} \right)$, "middle budget" $\left( \frac{-S+ba\,y-\delta}{1+ba} < w_{FP} \leq \frac{-S+ba\,y-(1+ba)V}{1+ba} \right)$ and the "high budget" $\left( w_{FP} \geq \frac{-S+ba\,y-(1+ba)V}{1+ba} \right)$ cases, respectively. Here, the size of the "budget" depends on all the parameters of the model, and the categories reflect how much slack workers have available for cash donations. These categories, specific to the purely altruistic workers, are defined with respect to the level of for-profit market wage $w_{FP} = \widetilde{w_{NP}} + V$.

The classification aids the interpretation of Propositions 1 and 2. In the compassionate-career situation, Proposition 1 shows that the low- and middle-budget workers end up donating labor only, meaning that they work with the nonprofit for a below-market wage. In contrast, the high-budget workers give both money and labor to the nonprofit. The combination of these two gifts makes them insensitive to the actual wage. Meanwhile, their consumption starts depending (positively) on the subsidy received by the nonprofit.

In the earning-to-give situation there is no labor donation, and a purely altruistic worker may not even make a cash donation (if her budget is low), even though she is motivated and gains utility from its output. The middle-budget workers, however, have the budget needed to work with the for-profit firm and make cash donations to the nonprofit. The high-budget workers are wealthier in the earning-to-give situation (i.e., no labor donation), and are thus able to make even larger cash donations.

Table 1 summarizes the options offered to purely altruistic workers with low, middle, and high budgets, respectively. The table shows that the only feasible donation for low-budget workers is labor donation, through higher productivity for a lower wage. Low-budget workers cannot afford giving money away even though they are motivated. The pattern was highlighted by Shahrier and Kotani (2014) in studying the ways that citizens contributed to post-cyclone relief in Bangladesh. Whether the labor-donation scenario is optimal to these workers or not depends on the parameters of the model, and notably on their degree of altruism $b$.

**Table 1: Summary of the Possible Outcomes**

| Worker<br><br>Situation | Low budget<br><br>$W_{FP} \leq \frac{-S+ba\,y-\delta}{1+ba}$ | Middle budget<br><br>$\frac{-S+ba\,y-\delta}{1+ba} < W_{FP} \leq$<br>$\frac{-S+ba\,y-(1+ba)V}{1+ba}$ | High budget<br><br>$W_{FP} \geq \frac{-S+ba\,y-(1+ba)V}{1+ba}$ |
|---|---|---|---|
| **Compassionate Career** | Labor donation<br><br>No cash donation | Labor donation<br><br>No cash donation | Labor donation<br><br>Cash donation |
| **Earning-to-give** | No labor donation<br><br>No cash donation[14] | No labor donation<br><br>Cash donation | No labor donation<br><br>(Higher) cash donation |

From the nonprofit employer's standpoint, things are quite different. Regardless of the worker's utility function, a low-budget motivated worker is valuable to the nonprofit only as an employee (i.e., in the compassionate career case). Yet, the threshold for categorizing a worker as low budget is sensitive to characteristics that are specific to the nonprofit, including the production technology ($a$), the wage gap ($\delta$), and the external subsidy ($S$). Both the subsidy and the wage gap have a negative impact on the low-budget threshold. To some extent, the nonprofit has leverage on the type of donations it has access to. All else equal, highly subsidized nonprofits and nonprofits with large wage gaps are more likely to attract altruistic workers who can afford making cash donations. The interpretation is that such nonprofits can find it easier

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[14] Even if the altruistic worker makes no donation at all to the nonprofit, she still gains utility from the subsidized output of the nonprofit.

than others to hire a regular workforce, either because their budget constraint is relaxed by subsidies, or because the wage gap makes this workforce cheaper to them.

By contrast, the middle-budget workers can choose between only-labor and only-money donations. They lack the resources to combine both types of donations. The extra wage obtained from working with the for-profit firm is needed to allow donating money to the nonprofit. Again, the optimal occupation rests on the values of the parameters at stake.[15] The width of the middle-budget class is $\left(V - \frac{\delta}{1+ba}\right)$. It is always positive and decreases with the size of the labor donation.

The high-budget worker will always give money to the nonprofit. But she has two options regarding labor donation: either the Bill and Melinda Gates option (compassionate-career case) or the Warren Buffet option (earning-to-give case). The next section discusses how the choice is made between these two options.

Overall, the connection between labor donation and cash donation is complex and highly non-linear. It depends chiefly on the characteristics of the nonprofit, and on the professional skills, external income, and degree of altruism of the potential donors. There is a fundamental difference between the so-called low-budget workers whose budget limitation rules out any cash donation, and the two other categories of motivated workers for whom the occupational choice interacts with the decision on cash donation.

Last, we determine the optimal occupational choices of the three categories of motivated workers and compare them to the preferences of the nonprofit, which maximizes its charitable output. The pure altruist is confronted with the choice of working with the nonprofit (compassionate-career case) and getting utility $U_{CC}$, or working with the for-profit (earning-to-give case) and getting utility $U_{ETG}$, where:

$$U_{CC} = \ln C_{CC}^* + b \ln Q_{CC}^* \tag{30}$$

$$U_{ETG} = \ln C_{ETG}^* + b \ln Q_{ETG}^* \tag{31}$$

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[15] Note that the utility obtained in the money-donation case is independent of the nonprofit wage. Still, this result only holds for wage levels that fulfill the inequality that makes total income high enough to belong to the middle-budget category. In fact, the width of the middle-budget category heavily rests on the wage gap $\delta$, i.e. the non-monetary compensation of regular workers.

The difference between the utilities in (30) and (31) may be split in two terms, the first related to optimal consumption, and the second comparing optimal output of the nonprofit.

$$\Delta U = U_{CC} - U_{ETG} = \Delta \ln C^* + b \, \Delta \ln Q^* \tag{32}$$

where:

$$\Delta ln \, C^* = \ln C_{CC}^* - \ln C_{ETG}^* \tag{33}$$

$$\Delta ln \, Q^* = \ln Q_{CC}^* - \ln Q_{ETG}^* \tag{34}$$

To explore the signs of $\Delta ln \, C^*$ and $\Delta ln \, Q^*$, the next propositions compare optimal consumption and output in the compassionate-career and earning-to-give cases, respectively.

**Proposition 4:** For all types of motivated workers, optimal consumption in the earning-to-give case is not smaller than in the compassionate-career case: $\Delta ln \, C^* = \ln C_{CC}^* - \ln C_{ETG}^* \leq 0$.

**Proof:** see Appendix B

In the earning-to-give option, the motivated worker gains extra earnings from working with the for-profit firm. But when it comes to the practical consequences for the nonprofit, there is a dramatic difference between the case of low-budget workers who, according to Table 1, devote the full wage surplus to their own consumption, and the middle and high-budget workers who share it between (selfish) consumption and (altruistic) cash donation. The proportions allocated to each item (see Equation (20)) depend on both the worker's level of altruism and on the production function. The next proposition describes the impact of the resulting cash donations on nonprofit output and compares it to the outcomes of the compassionate-career situation.

**Proposition 5:** For middle- and-high budget workers, the optimal nonprofit output in the earning-to-give case is not smaller than in the compassionate-career case: $\Delta ln \, Q^* = \ln Q_{CC}^* - \ln Q_{ETG}^* \leq 0$.

**Proof:** see Appendix C

Propositions 4 and 5 show that the interests of middle- and high-budget purely altruistic workers are fully aligned with those of the nonprofit. With higher consumption and larger output, the workers in these two categories will automatically opt to earn-to-give. This occupational choice

delivers indeed a financial surplus that increases consumption while boosting simultaneously the production of the public good by the nonprofit.

While the altruistic worker is concerned with consumption (in Proposition 4) and output (in Proposition 5), the nonprofit compares levels of the two donations. The nonprofit prefers the earning-to-give option if the cash donation it entails is greater than the cost of replacing a motivated worker with a regular worker, i.e. $D > (V - \delta)$. The next proposition shows that this condition is unequivocally met for high-budget workers. For low-budget workers, the situation is reversed since those workers can never afford to make cash donations. The situation of the middle-budget workers is less clear since the outcome depends on the parameters of the model.

**Proposition 6:**

- For high-budget workers, the optimal cash donation in the earning-to-give case is not smaller than the extra cost of hiring a regular worker: $\Delta \ln D^* = \ln Q_{CC}^* - \ln D_{ETG}^* \geq V - \delta$. Hence, the nonprofit prefers the earning-to-give option (ETG).

- For low-budget workers, the inequality is reversed: $\Delta \ln D^* = 0 \leq V - \delta$. Hence, the nonprofit prefers the compassionate career option (CC).

- For middle-budget workers, the situation depends on the parameter configuration. If the labor donation is low enough: $V < \overline{V} = w_{FP} + \frac{bay - ba\delta - S}{1 + ba}$, then the situation is the same as for high-budget workers. Otherwise, it mimics the situation of low-budget workers.

**Proof:** see Appendix D

Note that the likelihood of finding a worker in the middle-budget situation itself varies with parameter *V*. The smaller *V*, the narrower the width $\left(V - \frac{\delta}{1 + ba}\right)$ of the middle-budget segment . Moreover, the delimitations of the middle-budget case featured in Table 1 show that, when the middle-budget segment shrinks due to a decrease of V, it is in favor of the high-budget case and not the low-budget one.

Threshold $\overline{V}$ represents the limit value of labor donation *V* below which the nonprofit prefers seeing the middle-budget altruist opt for the *ETG* solution. As far as alignment is concerned, when $V < \overline{V}$, the middle-budget worker is in the same situation as the high-budget worker. Alternatively, when $V > \overline{V}$, she finds herself in the same situation of the low-budget worker.

The next theorem provides the optimal solution for each budget class. In addition, it compares the worker's optimum to that of the nonprofit. The preference of the nonprofit holds regardless of the presence of impure altruism. Therefore Proposition 6 will be useful as a benchmark in the next section as well.

**Theorem 1: Occupational Choice of Pure Altruists**

- The high-budget motivated worker opts for the earning-to-give solution.[16] This choice is aligned with the interests of the nonprofit.

- The middle-budget motivated worker opts for the earning-to-give solution. This choice is aligned with the interests of the nonprofit if and only if the labor donation is low enough: $V < \overline{V} = w_{FP} + \frac{bay - ba\delta - S}{1 + ba}$. Otherwise, the choice is not aligned.

- For the low-budget motivated worker, the nonprofit prefers the compassionate career, and the worker makes that choice if and only if his level of altruism is large enough: $b > \underline{b} = \frac{\ln(y + w_{FP} - V) - \ln(y + w_{FP})}{a[\ln(S - w_{FP} - \delta) - \ln(S - w_{FP} - V)]}$. Otherwise, the choice is not aligned.

**Proof:** see Appendix E

Table 2 summarizes the situation for pure altruists. The table shows that motivated workers acting on pure altruism choose to earn-to-give in most contexts, but it is not always the preferred outcome of the nonprofit. Barigozzi et al. (2018) also find that a wage increase has mixed consequences on the alignment of the interests of the firm and its motivated worker. Our results go in the same direction since a wage increase systematically pushes up the worker's budget. However, in Barigozzi et al. (2018), the effect is driven by the correlation between ability and motivation, while in our case it is due to the trade-off between labor and cash donation for the workers who cannot afford both.

Low-budget altruists cannot afford to make cash donations. Needing to consume, some will opt to work for the for-profit to earn the higher wage but still lack a surplus to share with others. In other words, they choose the "earning to give" option without actually giving. But if their degree of altruism is great enough (given by the condition on *b*), they may opt to make a

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[16] In the special case where there is no wage gap ($\delta = 0$) the high-budget worker is actually indifferent between the two options: earning-to-give and compassionate career.

labor donation by working for the nonprofit (as in Shahrier & Kotani 2014), which the nonprofit prefers.

The middle-budget group always opts for the earning-to-give career. By definition, they have the budget to make a cash donation, but the donation could be small. From Proposition 6, the outcome is optimal for the nonprofit only if the donation is large enough, captured by $V < \overline{V}$. The high-budget group can give more, and the nonprofit prefers this outcome.

The bottom row of Table 2 summarizes the alignment between the workers' choices and the nonprofit's preferences. For "low-budget" workers, the nonprofit can only hope for a labor donation (since their budgets don't permit cash donations). If their altruism is limited, they will neither give money nor time, but if their altruism is sufficiently high, they will opt for the compassionate career (where interests are aligned). The "high-budget" workers take high-paying jobs and make cash donations to the nonprofit, again aligning interests. The "middle-budget" workers are in between, and the nonprofit prefers that they "earn to give" and provide cash donations. In general, lower budgets lead to a greater chance for misalignment.

**Table 2: Outcome of the Model: Pure Altruism**

| | Low budget | | Middle budget | | High budget |
|---|---|---|---|---|---|
| **Parameter configuration** | $b > \underline{b}$ | $b < \underline{b}$ | $V > \overline{V}$ | $V < \overline{V}$ | |
| **Occupational choice** | Compassionate Career | Earning to give | Earning to give | | Earning to give |
| **Worker's optimum** | Labor donation | No donation | Cash donation | | Cash donation |
| **Nonprofit's preference** | Labor donation | | Labor donation | Cash donation | Cash donation |
| **Alignment** | Yes | No | No | Yes | Yes |

## 5. Impure Altruism and Warm Glow

Adding impure altruism shifts some workers' choices. We model impure altruism in a particular way, though a constant term for warm glow added to the utility of motivated workers who choose the compassionate career. Impure altruists here are thus pure altruists whose occupational choice is tilted in favor of working with the nonprofit.

Introducing impure altruism, represented by parameter $c$ in Eq. (2), yields a change in the utility associated with the compassionate-career case:

$$U_{CC} = \ln C_{CC}^* + b \ln Q_{CC}^* + c \tag{35}$$

where the last term refers to the personal preference for working with the nonprofit. Accordingly, the difference between the utilities corresponding to the two occupational choices becomes:

$$\Delta U = U_{CC} - U_{ETG} = \Delta \ln C^* + b \, \Delta \ln Q^* + c \tag{36}$$

Using Propositions 4 and 5, we derive the next theorem describing the final decision of the workers motivated by both pure and impure altruism. The theorem shows that adding impure altruism brings some workers into alignment with the nonprofit but pushes other workers out of alignment.

**Theorem 2: Occupational Choice of Mixed Altruists**

- If $0 < c < \bar{c}_{HB} = \ln\left[\left(\frac{S+y+\delta}{S+y}\right)^{ab+1}\right]$, the high-budget motivated worker opts for the earning-to-give solution, which is aligned with the nonprofit interests. Otherwise, she opts for the compassionate career, which is suboptimal for the nonprofit.

- If $0 < c < \bar{c}_{MB} = \ln\left\{ab^{ab}\left[\frac{S+y+\delta}{(1+ba)(y+w_{FP}-V)}\right]^{ab+1}\right\}$, the middle-budget motivated worker opts for the earning-to-give solution. This choice is aligned with the interests of the nonprofit if and only if the labor donation is high enough: $V > \bar{V} = w_{FP} + \frac{bay - ba\delta - S}{1+ba}$. If $c > \bar{c}_{MB}$, the middle-budget motivated worker chooses the compassionate career, which is aligned with the nonprofit's preference if $V > \bar{V}$.

- If $0 < c < \bar{c}_{SB} = \ln\left[\frac{y+w_{FP}}{y+w_{FP}-V}\left(\frac{S-w_{FP}-\delta}{S-w_{FP}-V}\right)^{ab}\right]$, the low-budget motivated worker makes no donation (degenerate earning-to-give case); if $c > \bar{c}_{SB}$, this worker choses the compassionate career, which is aligned with the preference of the nonprofit.

**Proof:** see Appendix F

Table 3 summarizes the situation for the cases where the impure altruism parameter $c$ is large enough to encourage the worker to deviate from the pure-altruism optimum shown in Table 2.[17] Table 4 then compares the results on alignment in Table 2 (pure altruism) with Table 3 (pure and impure altruism). Table 3 shows that a value of $c$ larger than its budget-specific threshold implies that warm glow makes the worker want a compassionate career. In the low- and middle-budget situations, this also implies that the worker makes no cash donation. By contrast, the high-budget worker does always make a cash donation, but working for the nonprofit yields a wage reduction, which mechanically reduces his monetary gift.

**Table 3: Outcome of the Model when Impure Altruism Affects Worker's Choice**

|  | **Low budget** | **Middle budget** | | **High budget** |
|---|---|---|---|---|
| **Parameter configuration** |  | $V > \overline{V}$ | $V < \overline{V}$ |  |
| **Occupational Choice** | Compassionate career | Compassionate career | | Compassionate career |
| **Worker's optimum** | Labor donation | Labor donation | | Cash donation + labor donation |
| **Nonprofit's preference** | Labor donation | Labor donation | Cash donation | (Larger) Cash donation |
| **Alignment** | Yes | Yes | No | No |

Note: The table is built on the assumption that the impure altruism parameter $c$ is above the budget-specific threshold $\overline{c}$ such that it is sufficiently large to matter for choices. For the low budget case, $c > \overline{c}_{SB}$; for the middle budget case, $c > \overline{c}_{MB}$; and for the high budget case, $c > \overline{c}_{HB}$.

For nonprofits, warm glow is neither a blessing nor a curse. The global effect depends on the type of workforce it intends to hire. Since warm glow creates misalignment for workers in the upper budget segment, it can hurt nonprofits that rely on a highly skilled workforce. The presence of warm glow feelings might therefore be costly to such nonprofits. In contrast, nonprofits whose production technology is based on blue-collar workers are likely to be more productive when the presence of warm-blow attracts motivated low-budget workers and middle-budget workers willing to make large labor donations.

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[17] Otherwise, when $c$ is below its budget-specific threshold, the outcome of the model is the same as in the case of pure altruism featured in Table 2 for $c = 0$.

The expression of $\overline{c}_{HB}$ in Theorem 2 shows that when there is no wage gap ($\delta = 0$) the threshold on impure altruism for high-budget workers reduces to zero: $\overline{c}_{HB} = 0$. In this special case, both types of firms pay the same wage to regular workers. The high-budget worker with impure altruism, no matter how small ($c > \overline{c}_{HB} = 0$), will always prefer to work with the nonprofit. This situation is in line with experimental evidence showing that people experience the warm glow of a labor donation more strongly than an equivalent cash donation (Brown et al. 2018). Warm glow feelings push the worker toward taking a job with the nonprofit, even when the resulting solution is suboptimal for the nonprofit. Consistent with the results of Dur and van Lent (2018), Theorem 2 shows that this mismatch depends on the parameters of the model. A non-zero wage gap ($\delta > 0$) mitigates the mismatch by increasing the odds that the altruist makes the earning-to-give occupational choice. This is because $\overline{c}_{HB}$ depends positively on $\delta$. An interpretation is that nonprofits with high appeal for the general population offer regular workers wages significantly lower than those available in the for-profit sector, thus pushing motivated workers toward the earning-to-give option.

Next, consider the motivated workers with low and middle budgets. Theorem 1 highlighted that the budget constraint influences the altruistic behavior, not only quantitatively (lower donations), but also qualitatively (different trade-offs). By introducing impure altruism, Theorem 3 reconciles, to some extent, the situations of the three groups of motivated of workers. In each category, there exists a threshold for warm glow above which any worker is willing to work for the nonprofit. However, the optimal occupational choice of budget-constrained motivated workers departs from that of their high-budget counterpart in that a zero wage gap ($\delta = 0$) is insufficient to make them switch toward a compassionate career if this option was not already their preferred outcome under pure altruism. The reason is that their budget constraint makes them unable to make an extra cash donation that would compensate for the lack of a labor donation. In short, the "Warren Buffet option" requires a high budget to secure a decent consumption level.

A testable consequence of the model is that nonprofits with low market wage gaps should attract disproportionally more budget-constrained impure altruists than wealthy ones. High market wage gaps play in favor of the earning-to-give option and can compensate, to some extent, the counter-effect of impure altruism.

**Table 4: Comparison of Alignment with Both Pure and Impure Altruism**

| | Low budget | | Middle budget | | High budget |
|---|---|---|---|---|---|
| Parameter configuration | $b > \underline{b}$ | $b < \underline{b}$ | $V > \overline{V}$ | $V < \overline{V}$ | |
| Alignment for pure altruist | Yes | No | No | Yes | Yes |
| Alignment with impure altruism | Yes | | Yes | No | No |

Table 4 shows how the budget level affects the trade-off between giving cash and giving time. While pure altruists with a high budget adopt the earning-to-give option, which aligns with the interests of the nonprofit, impure altruism can distort this alignment. By contrast, by pushing workers toward adopting the compassionate career, impure altruism can push low-budget altruists to work for the nonprofit—even though pure altruism would not align interests. In this case, impure altruism is helpful from the nonprofit's perspective. For the middle-budget workers, the impact of impure altruism can go both ways depending on the parameters of the model. Pure altruists in the middle-budget group choose the earning-to-give option. For a small labor donation $V$, this choice is optimal for the nonprofit too, so that impure altruism can only be detrimental to the alignment. But for large values of $V$, the preference of purely altruistic workers pushes them away from the nonprofit's optimum, and the presence of impure altruism can boost alignment.

There is just one single category of workers that are always aligned with the nonprofit regardless of warm glow. This category includes low-budget workers with a high degree of pure altruism $\left(b > \underline{b}\right)$ who always opt to make a labor donation, whether or not they also get a warm glow from working for the nonprofit.

Overall, the model emphasizes that altruism can affect the occupational choices of pro-social, motivated workers. To them, higher wages are not only a way to increase their own consumption, but also a tool for enhancing their contribution to the greater good. But the results highlight that both pure and impure altruism can lead workers to make occupational choices that diverge from the nonprofit's interests. In these cases, there is a trade-off between the welfare of the worker and the welfare of the institution they care about. In our framework, the

level of warm glow is exogenous. More realistically, however, firms may try to shape feelings of warm glow, perhaps through communications and by choices in designing their office environment (see Aldashev et al. 2017 who endogenize warm glow in a general-equilibrium model).

Paradoxically, a byproduct of effective altruism and "earning to give" could be wage equalization across the for-profit and nonprofit sectors, especially for the high-end jobs for which the wage gap is large (Weisbrod, 1983; Preston 1990). The pay increase in nonprofits could stem from the desire to attract or retain the skilled and most motivated employees (Jones, 2015). Since efficiency-conscious donors typically rank charities on the basis of their overheads (Cochrane & Thornton, 2016; Meer, 2017), a wage increase might further hurt nonprofits relying on skilled workers. Delfgaauw and Dur (2010) argue, however, that regardless of information asymmetries, bringing remunerations in nonprofits to their for-profit level to attract skilled workforce is cost-inefficient. Barigozzi and Burani (2016) argue that motivation is more important than ability for firms that benefit from the labor donations of their motivated workers.

## 6.    Conclusion

We consider workers who are motivated to make the world a better place. Most of the theory of labor markets instead considers "non-motivated" workers who work to earn wages, but who are not intrinsically motivated by the output of their employer. We join recent studies in departing from that assumption.

We have focused on trade-offs between giving time and money. Andreoni (2006, p. 1252) concludes: "In sum, the literature on time and money contributions is in great flux, and there has yet to be a definitive study to address this gap." Our goal has been to simplify in order to highlight particular mechanisms and relationships. Next steps will require greater complexity. For example, we use a utility function that, although standard, has specific features that could drive some results (such as the proportionality result that aligns the interests of the motivated worker and the nonprofit firm). Another simplification comes from the fact that we assume that the job market is in equilibrium, so that everybody is passive except for the motivated worker. This allows us to focus on the worker's occupational choice. In a more general setting, the non-profit and for-profit may be active and strategic.

Much recent analysis of motivated workers focuses on volunteers. The model we present instead describes motivated workers who have standard wage-paying jobs. The twist is that they gain utility from the output of a particular charitable organization (in the spirit of "effective altruism"), and, as a result, they might be willing to accept a lower wage working for the nonprofit than what they would require from a for-profit. When they do so, the worker is effectively donating time. The motivation here is not due simply to "warm glow" but reflects an altruistic desire to maximize personal impact on others subject to budget constraints. (Imas, 2014; Lilley & Slonim, 2014; MacAskill 2015).

The altruistic worker has another choice as well. Even if she does not work directly for the charitable organization, she can help by working at a standard for-profit firm and donating money to the nonprofit. If her for-profit salary is high enough, she may in fact help the nonprofit organization more by donating money than by working for it directly. This is the gist of the "earning to give" principle championed by advocates of effective altruism (Singer 2015).

We show that outcomes shift with workers' budgets and the form (and degree) of altruism. From the nonprofit's perspective, all else equal, the best outcome is to hire low-budget workers motivated by impure altruism, while taking money from high-budget workers who are willing to go to Wall Street and then make large contributions. But that kind of alignment is not the only possible outcome; introducing warm glow feelings (in addition to purely altruistic motivations) can bring outcomes into alignment for some workers but take them out of alignment for others.

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## Appendix A: Proof of Proposition 3

From Propositions 1 and 2 we have:

$$D_{CC}^* = Max\{0, X_1\}$$

$$D_{ETG}^* = Max\{0, X_2\}$$

where:

$$X_1 = \widetilde{w_{NP}} + \frac{-S + ba\,y}{1+ba}$$

and

$$X_2 = w_{NP} + \frac{-S + ba(y+\delta)}{1+ba}$$

Moreover, the two wage gaps are expressed with reference to the for-profit market wage as:

$$w_{FP} = \widetilde{w_{NP}} + V = w_{NP} + \delta$$

which yields:

$$X_1 = w_{FP} - V + \frac{-S + ba\,y}{1+ba} = w_{FP} + \frac{-S + ba\,y - (1+ba)V}{1+ba}$$

and:

$$X_2 = w_{FP} - \delta + \frac{-S + ba(y+\delta)}{1+ba} = w_{FP} + \frac{-S + ba\,y - \delta}{1+ba}$$

Finally,

$$V \geq \delta \Rightarrow (1+ba)V \geq \delta.$$

If follows that $X_1 \leq X_2$.

<div align="right">QED</div>

## Appendix B: Proof of Proposition 4

If $w_{FP} \leq \frac{-S + ba\,y - \delta}{1+ba}$ (low budget):

$$C_{ETG}^* = y + w_{FP} \geq C_{CC}^* = y + w_{FP} - V$$

If $\frac{-S + ba\,y - \delta}{1+ba} < w_{FP} \leq \frac{-S + ba\,y - (1+ba)V}{1+ba}$ (middle budget):

$$C_{ETG}^* = \frac{S + y + \delta}{1+ba} \geq C_{CC}^* = y + w_{FP} - V$$

because:

$$\frac{S + y + \Delta}{1+ba} - (y + w_{FP} - V) = \frac{S - ba\,y + \delta + (1+ba)V}{1+ba} - w_{FP}$$

$$\geq \frac{S - ba\,y + \delta + (1+ba)V}{1+ba} + \frac{-S + ba\,y - \delta}{1+ba} = \delta \geq 0$$

If $w_{FP} \geq \frac{-S + ba\,y - (1+ba)V}{1+ba}$ (high budget):

$$C^*_{ETG} = \frac{S + y + \delta}{1+ba} \geq C^*_{CC} = \frac{S+y}{1+ba}$$

We use the monotonicity of the log function to conclude that $\Delta lnC^* \leq 0$

<div align="right">QED</div>

## Appendix C: Proof of Proposition 5

If $\frac{-S + ba\,y - (1+ba)V}{1+ba} < w_{FP} \leq \frac{-S + ba\,y - \delta}{1+ba}$ (middle budget):

$$Q^*_{CC} = (S - w_{FP} + V)^a \text{ and } Q^*_{ETG} = \left(\frac{ba(y+S+\delta)}{1+ba}\right)^a \geq Q^*_{CC}$$

because: $S - w_{FP} + V \leq S - \frac{S - bay - (1+ba)V}{1+ba} = \frac{ba(y+S) + (1+ba)V}{1+ba} \leq \frac{ba(y+S+\delta)}{1+ba}$

If $w_{FP} \geq \frac{-S + ba\,y - \delta}{1+ba}$ (high budget):

$$Q^*_{CC} = \left(\frac{ba(y+S)}{1+ba}\right)^a \text{ and } Q^*_{ETG} = \left(\frac{ba(y+S+\delta)}{1+ba}\right)^a \geq Q^*_{CC}$$

We use the monotonicity of log to derive that $\Delta lnQ^* \leq 0$.

<div align="right">QED</div>

## Appendix D: Proof of Proposition 6

For high-budget motivated workers, we have from Propositions 1 and 2:

$$D^*_{CC} = \widetilde{w_{NP}} + \frac{-S + bay}{1+ba} == w_{FP} - V + \frac{-S + bay}{1+ba}$$

$$D^*_{ETG} = w_{NP} + \frac{-S + ba(y+\delta)}{1+ba} = w_{FP} - \frac{\delta}{1+ba} + \frac{-S + bay}{1+ba}$$

Since $ab > 0$, comparing the two equations shows that the spread between the two optimal donations is:

$$D^*_{ETG} - D^*_{CC} = V - \frac{\delta}{1+ba} < V - \delta,$$

This inequality proves the result.

The low-budget motivated worker makes no cash donations (see Propositions 1 and 2):

$$D^*_{CC} = D^*_{ETG} = 0$$

Hence, the nonprofit will obviously prefer the *CC* situation providing labor donation over the *ETG* one that excludes any donation.

$$D^*_{ETG} - D^*_{CC} = 0 < V - \delta.$$

For middle-budget motivated workers, we have from Propositions 1 and 2:

$$D^*_{CC} = 0$$

$$D^*_{ETG} = w_{NP} + \frac{-S + ba(y + \delta)}{1 + ba}.$$

As a result, we have:

$$D^*_{ETG} - D^*_{CC} = w_{NP} + \frac{-S + ba(y + \delta)}{1 + ba} > V - \delta \iff V < \overline{V}$$

where $\overline{V} = w_{FP} + \frac{bay - ba\delta - S}{1 + ba}.$

<div align="right">QED</div>

## Appendix E: Proof of Theorem 1

For middle and high budget, we have from Propositions 4 and 5:

$$\Delta U = U_{CC} - U_{ETG} = \underbrace{\Delta \ln C^*}_{\leq 0} + b \underbrace{\Delta \ln Q^*}_{\leq 0} + c$$

As a result:

$c = 0 \Rightarrow \Delta U \leq 0$, and the earning-to-give solution is dominant because it delivers higher utility to the motivated worker with a middle or high budget.

For high-budget workers, Proposition 6 shows that the nonprofit prefers the *ETG* situation, so that the preferences of the worker and the nonprofit are aligned.

Middle-budget motivated workers opt for the *ETG* solution. As stated in Proposition 6, this option is also optimal for the nonprofit provided that $V < \overline{V}$.

The preference of the low-budget worker is less obvious than that of his high- and middle-budget counterparts since Proposition 5 does not apply to low-budget workers. Therefore, in this case we have to compute the utility functions with and without labor donation:

$$\Delta U = U_{CC} - U_{ETG} = \ln C_{CC}^* - \ln C_{ETG}^* + b \left( \ln Q_{CC}^* - \ln Q_{ETG}^* \right)$$

$$= \ln \left( y + w_{FP} - V \right) - \ln(y + w_{FP}) + ab[\ln \left( S - w_{FP} - \delta \right) - \ln(S - w_{FP} - V)]$$

The motivated worker chooses the compassionate career when $\Delta U > 0$.

$$b > \underline{b} = \frac{\ln \left( y + w_{FP} - V \right) - \ln(y + w_{FP})}{a[\ln \left( S - w_{FP} - \delta \right) - \ln(S - w_{FP} - V)]}$$

This condition is expressed as a threshold[19] on the low-budget worker's degree of altruism above which the worker will prefer CC over ETG, and so aligns her preferences with that of the nonprofit. Note that $\underline{b} > 0$ as soon as labor donation is a real possibility $(V > 0)$, meaning that there always exist values of the altruism parameter $b$ small-enough $\left( 0 < b < \underline{b} \right)$ to make the low-budget worker's optimum diverge from the nonprofit's first-best option.

<div align="right">QED</div>

**Appendix F: Proof of Theorem 2**

We have:

$$\Delta U = U_{CC} - U_{ETG} = \Delta \ln C^* + b \, \Delta \ln Q^* + c$$

The compassionate-career solution will thus be chosen when:

$$c > \overline{c} = -\Delta \ln C^* - b \, \Delta \ln Q^*$$

where $\overline{c}$ depends on the level of budget of the motivated worker. Precisely, $\Delta \ln C^*$ is computed for each budget size in Appendix B, $\Delta \ln Q^*$ is given in Appendix C for high and middle budgets and in Appendix E for low budgets. Hence, we derive the threshold value for impure altruism:

$$\overline{c} = \begin{cases} \ln \frac{y+w_{FP}}{y+w_{FP}-V} + ab \ln \frac{S-w_{FP}-\delta}{S-w_{FP}-V} & for \ low \ budget \\ \ln \frac{S+y+\delta}{(1+ba)(y+w_{FP}-V)} + ab \ln \frac{ba(y+S+\delta)}{(1+ba)(y+w_{FP}-V)} & for \ middle \ budget \\ \ln \frac{S+y+\delta}{S+y} + ab \ln \frac{S+y+\delta}{S+y} & for \ high \ budget \end{cases}$$

---

[19] To simplify this condition, we can linearize the logarithm $(\ln x \cong x)$ and write: $\Delta U \cong -V + ab(V - \delta) > 0$. Threshold $\underline{b}$ can therefore be proxied by: $\tilde{\underline{b}} = \frac{V}{a(V-\delta)}$,

$$= \begin{cases} \ln\left[\frac{y+w_{FP}}{y+w_{FP}-V}\left(\frac{S-w_{FP}-\delta}{S-w_{FP}-V}\right)^{ab}\right] = \overline{c}_{SB} & \text{for low budget} \\[2ex] \ln\left\{ab^{ab}\left[\frac{S+y+\delta}{(1+ba)(y+w_{FP}-V)}\right]^{ab+1}\right\} = \overline{c}_{MB} & \text{for middle budget} \\[2ex] \ln\left[\left(\frac{S+y+\delta}{S+y}\right)^{ab+1}\right] = \overline{c}_{HB} & \text{for high budget} \end{cases}$$

These quantities are the threshold above which altruistic workers of each category choose the compassionate career. Moreover, the preference of the nonprofit does not depend on warm glow, and is straightforward from Proposition 6.

<div align="right">QED</div>