

Is Labor Productivity More Sensitive to Corporate Philanthropy Towards Welfare Shocks or Chronic Conditions?

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Abstract

Do increases in labor productivity that follow from corporate philanthropy vary based on the societal causes to which firms donate? Integrating insights from psychological research showing that individuals respond more charitably towards beneficiaries who experience a negative welfare shock (e.g., those afflicted by disasters) than beneficiaries in a chronic state of low welfare (e.g., those living in poverty), we develop and test the argument that employees exert more effort at work when their firm's philanthropy targets welfare loss than when philanthropy targets chronic conditions. Using longitudinal data on corporate philanthropy from large U.S. companies, we present identification strategies that consistently support our argument. Our estimates suggest that, on average, a 6.63 percent greater increase in marginal labor productivity occurs when companies donate towards welfare loss after sudden negative shocks—such as epidemics, natural disasters, and terrorist attacks—vis-à-vis donations to chronic conditions like poverty and homelessness. This correlation survives accounting for a vector of joint fixed effects and time-varying controls as well as a battery of robustness checks. The findings suggest that the targets of philanthropic donations are important for the ways in which corporate giving acts as a non-pecuniary incentive.

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1. Introduction

Amidst continued challenges in using monetary incentives to motivate worker productivity (Holmstrom 1979, Larkin, Piece, and Gino 2012), firm leaders have increasingly turned to prosocial behavior to motivate top talent (PricewaterhouseCoopers, 2016). In line with increased managerial attention, scholars have begun to document how firm prosocial behavior may serve as a nonmonetary incentive for employees (Bode et al. 2015, Farooq et al. 2017, Flammer and Kacperczyk 2019, Flammer and Luo 2016). For instance, studies have found that providing information on corporate philanthropy to workers yields a 13% rise in worker productivity (Tonin and Vlassopoulos 2015) and up to 44% lower wage bids (Burbano 2016). Prosocial behavior like corporate philanthropy has been argued to increase employee satisfaction and, as a result, willingness to exert more effort for the same level of compensation (Burbano 2016, Flammer 2015, Flammer and Kacperczyk 2016, 2019, Gubler et al. 2018).

Yet, it remains unclear whether the effect of corporate philanthropy on labor productivity varies as firms support different societal causes. Our understanding is limited in part because while in practice firms donate to a spectrum of different societal issues such as education, human services, and health, existing studies have focused on demonstrating a positive main effect of philanthropy on productivity by comparing firms that donate with those that do not (Burbano 2016, 2019, Cassar and Meier 2018, Jones et al. 2014). Even when experimental studies have employed the name of different nonprofit organizations as hypothetical charity recipients (e.g., The Red Cross, The Global Hunger Project in Burbano 2016, 2019), they typically have not explored whether variation in the target area (e.g., disaster aid, hunger alleviation) results in changes in labor outcomes. At the same time, while not looking at employee outcomes directly, other studies suggest have begun to suggest that the causes supported by philanthropy are consequential for the ways that stakeholders assess and respond to corporate philanthropy (Bertrand et al. 2020, Cuypers et al. 2016, Seo et al. 2019).

To further our understanding of the relationship between different philanthropic programs and labor productivity, we consider a potentially important distinction between philanthropic causes: those that support beneficiaries who experienced a sudden loss of welfare and those that support beneficiaries facing chronic conditions. This categorization follows studies on individuals' charitable behavior, which have found that philanthropic beneficiaries who experience a sudden loss in welfare elicit greater sympathy and judgments of deservingness than beneficiaries who experience a constant state of misfortune (Small 2010, Sudhir et al. 2016, White et al. 2012). The theoretical mechanism behind these findings builds on the central tenets of prospect theory, namely, that individuals respond more strongly to losses from a given reference point than to equivalent gains (Kahneman and Tversky 1979, Tversky and Kahneman 1991). As a result, individuals display a greater charitable response towards beneficiaries that experience a negative welfare shock such that beneficiaries have a lower level of welfare compared to their previous state (as in disasters) vis-à-vis beneficiaries who suffer constant-state or longstanding levels of low welfare (as in poverty) (Small 2010, Sudhir et al. 2016). These findings also help explain why donations from individuals tend to outpour after natural disasters, while no similar outpouring occurs for ongoing misfortunes such as chronic diseases (Andreoni 2006, Epstein 2006, Small 2010, Spence 2006).

To add important nuance to our understanding of the relationship between philanthropy and labor productivity, we combine the premise that philanthropy motivates employee productivity with research showing preference for philanthropy towards victims of loss. Reflecting the preference of individuals in charitable giving, we posit that employees will be more satisfied, and thus exert more effort at work, when corporate philanthropy targets beneficiaries who experience welfare shocks, such as epidemics, natural disasters, and terrorist attacks, than when corporate philanthropy seeks to enhance the welfare of those facing chronic issues, such as education, health, and poverty alleviation. We thus hypothesize that, holding all else constant, corporate philanthropy targeting negative welfare shocks will yield greater employee productivity increases than corporate philanthropy targeting chronic conditions.

Using longitudinal data on large U.S. firms from 2007-2019, we offer evidence that a 6.63 percent greater increases in marginal labor productivity occurs after companies donate to welfare loss versus chronic conditions. Consistent with our predictions, our findings suggest that the target of philanthropy is highly consequential for the magnitude of any potential benefit for the firm. Our results hold great practical significance for leaders who allocate scarce corporate philanthropy resources.

2. Data, Measures, and Identification

2.1. Sample Data

The starting point for our sample is the 500 largest U.S. publicly traded companies by revenue in 2019. We draw complete administrative data from 2007 to 2019 from Orbis published by Bureau van Dijk. Estimates suggest that these companies account for over 90 percent of the magnitude of company philanthropy worldwide (Ballesteros and Magelssen 2020).

2.2. Labor Productivity

Our operationalization of marginal *labor productivity*, the outcome variable, is the ratio of revenue to the number of employees. We regress $\ln(1 + \text{labor productivity})$. This operationalization continues to be the best practice for firm-level administrative data and is ubiquitous across a wide range of literatures (Foster et al. 2008, Kline et al. 2019, Koch and Mcgrath 1996), including research documenting how labor productivity changes after firm prosocial behavior (Delmas and Pekovic 2013, Flammer 2015).

2.3. Type of Firm Philanthropic Program

Our main measure of corporate philanthropy is a categorical variable that groups companies into donors to negative welfare shocks, donors to chronic conditions, or non-donors each year.

To classify firms as donors towards *welfare shocks*, we start by identifying shocks that generate substantial drops in welfare, namely large epidemics, natural disasters, and terrorist attacks (Baker and Bloom 2013, Barro 2007). To achieve a stringent characterization of severity, we consider shocks whose impact ranks at the 99th percentile in the stricken country (Ballesteros and Magelssen 2020, Cavallo et al. 2013). To ensure the loss is sudden and not chronic (Small 2010), we include shocks in which the peak magnitude occurs within 30 days of its start date. There is a total of 232 welfare-shock events in the studied period. Data on philanthropy to welfare shocks comes from the Global Database of Disaster Responses (GDDR), which tracks all the reported cash and in-kind donations from organizations worldwide to major shocks since 1990 (for more information see the online Appendix). We identify 1,950 donations made towards welfare shocks and [N] firms who made welfare shock donations.

To classify firms as donors towards *chronic conditions*, we use donation data from the U.S. Internal Revenue Service (IRS) housed by the Foundation Center. The Foundation Center applies the National Taxonomy of Exempt Entities (NTEE) from the IRS to classify donations into different nonprofit sectors. We find 14 NTEE sectors oriented towards chronic social welfare issues, with 182 possible year-sectors in which firms could donate.¹ Donations to nonprofits that improve education such as The National Dropout Prevention Network (35.90 percent), health such as the Children’s Miracle Network Hospitals (14.33 percent), and community development such as the Local Initiatives Support Corporation (13.28 percent) account for 63.51 percent of the donations towards chronic needs. We draw upon the strategy of the extant literature to assure the relevance of philanthropy and condition the data to a minimum of \$1 million by grant (see, for example, Hornstein and Zhao 2018). We identify 3,050 donations across the 14 sectors of interest and [N] firms who made donations to chronic issues.

¹ The 14 nonprofit sectors related to social welfare enhancement: B Educational Institutions, E Health—General & Rehabilitative, F Mental, G Disease, Disorders, Medical Disciplines, H Medical Research, I Crime, Legal Related, J Employment, Job Related, K Agriculture, Food, Nutrition, L Housing, Shelter, O Youth Development, P Human Services, R Civil Rights, Social Action, Advocacy, S Community Improvement, Capacity Building, W Public, Society Benefit. For a similar classification of welfare-oriented nonprofits, see Marquis, Davis, and Glynn (2013).

When no donations were reported, we classify the company as a non-donor in the given year. Across the 13-year period, about 40 percent of companies in the sample were donors, with an average single donation to either type of philanthropy of nearly \$5 million and a standard deviation of \$4.7 million.

To achieve cleaner causal inference of the effect of each philanthropic target, we restrict our analysis to firm-years in which a company did not engage in donations to both welfare loss and chronic conditions. Of firm-years when donations are present, 37 percent exhibit both types of giving, and thus we drop these observations.

2.3. Firm, Beneficiary, and Nonprofit Sector Time-Varying Controls

We seek to control for time-varying factors that can potentially affect both labor productivity (Alfaro and Chen 2018, Bartelsman and Wolf 2014, Bloom et al. 2018, Serpa and Krishnan 2018) and the performance implications of company philanthropy productivity (Flammer and Luo 2016, Gubler et al. 2018, Lee et al. 2020, Lins et al. 2017, Tonin and Vlassopoulos 2015).

To approximate firm performance and size, which may affect a firm's capacity to donate, we control for the natural logarithm of *market capitalization* and *capital*. We also include measures of research and development intensity (*R&D*) and *advertising and administration* expenditures (logged), as these may determine intangible resources—such as cognition, reputation, and visibility—that can influence a firm's capacity to obtain increased productivity from philanthropy. Since Orbis has missing data in some of these variables, we test the existence of missing patterns and cannot reject the hypothesis that these data are missing completely at random. We thus apply a multiple-input bootstrapping algorithm for time-series-cross-sectional data as explained by Blackwell et al. (2017).

We further control separately for the *media publicity* that the donation attracted because media attention affects the level of awareness that employees have about their company's action and, in turn, explains their willingness to increase effort (Gubler et al. 2018, Servaes and Tamayo 2013). To collect these data, we run

automated searches in Python that collect the frequency of news reports using Factiva and Google. The search covers three months before and one year after the donation. Moreover, because it is likely that the marginal effect of philanthropy on productivity follows a monotonically decreasing trajectory, we include the count of donations that the company made within the year before the focal donation; we term this variable *donor fatigue*. To explore the possibility that company reputation sufficiently explains variance in the performance value of philanthropy, we calculate a Janis-Fadner coefficient of imbalance (see Zhang 2016 for a review of this measure).

Extant work suggests that certain factors of a beneficiary's locale are relevant for motivating philanthropy (Ballesteros and Gatignon 2019, Hornstein and Zhao 2018) and the institutional structure underlying the firm's ability to benefit from its donations (Ballesteros and Magelssen 2020, Bertrand et al. 2020, Dorobantu et al. 2017). Accordingly, for the beneficiary's city, we control for the *GDP*, the logs of *population*, the percent of *urban population*, and an index of level of *control of corruption* from the World Governance Indicators.² We collect these data from the U.S. Census, the Bureau of Economic Analysis and The World Bank World Development Indicators (WDI).³

It is also possible that characteristics of the shock event influence the relationship under study. We thus account for the *number of beneficiaries* and the magnitude of the *economic need* using data from the International Disaster Database (EM-DAT)⁴, the reinsurance company Swiss Re, and The United Nations

² According to the World Bank, the WGI is a research dataset summarizing the views on the quality of governance provided by a large number of enterprise, citizen, and expert survey respondents in industrial and developing countries. The six broad dimensions of governance that comprise the WGI are rule of law, voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, and control of corruption (Kaufmann et al. 2011). The estimates range from -2.5 to 2.5.

³ The World Development Indicators database contains internationally compatible statistics on 1,600 time-series indicators for 217 economies and more than 40 country groups. The database is compiled by the World Bank.

⁴ Institution supported by the World Health Organization that represents a comprehensive international database on catastrophes. Events included in the International Disaster Database must meet at least one of the following criteria: 10 or more people killed, 100 or more people affected, a declaration of a state of emergency, or a call for international assistance. Further information is at <http://www.emdat.be/>.

Office for the Coordination of Humanitarian Affairs (UNOCHA).⁵ The threshold of severity that we use to select welfare shocks is based on quartiles that we construct based on number of deaths, victims, or economic damage in U.S. Million. To calculate impact distributions by country, we use all the events in the EM-DAT dataset between 1990 and 2019. Complete summary statistics are presented in Table 1.

[INSERT Table 1 ABOUT HERE]

2.4. Firm, Industry, Beneficiary City, and Nonprofit Sector Fixed Effects

There are several potential determinants of labor productivity that may include a preference for specific philanthropic programs, the targeted societal cause, and geographic areas. We control for this using two joint fixed effects.

First, certain companies may self-select into cities with different likelihoods to attract donations. Consequently, firms with a similar level of labor productivity may be comparatively prone to engage in a specific giving programs or target communities that systematically correlate with the employees' interests. The inclusion of Firm \times Beneficiary City fixed effects accounts for the possibility, that, as a target community is economically important for the firm, it will be more likely to receive donations that motivate employees. For instance, companies are likely to donate in geographical markets that substantially explain their performance (Ballesteros and Magelssen 2020). Employees with higher or lower labor productivity may have altruistic motivations or other social preferences toward these communities (Andreoni 2006, Fehr and Fischbacher 2002). This could lead to a positive coefficient of donations even in the absence of a causal nexus between philanthropy and labor productivity.

⁵ Despite being the most used disaster database in empirical studies, EM-DAT has pervasive data inaccuracies and missingness. A substantial part of our work was dedicated to collect disruptions and we received critical assistance from UNOCHA and Swiss Re. We conducted separate checks with different members of the research team (see the Appendix) for data accuracy.

Second, the inclusion of Firm \times Nonprofit Sector (or event) fixed effects responds to the information that some specific societal areas or events have heterogeneous impacts on specific companies and their employees. For instance, a pharmaceutical company may be comparatively likely to donate to sector E, Health; food companies to sector K, Agriculture, Food, Nutrition; and construction companies to sector L, Housing, Shelter. The development of these sectors may have performance value for these companies and result in unobserved heterogeneity that affects the size of the effects of philanthropy on productivity. These relationships are likely to fluctuate across combinations of firms and sector. Similarly, firms with specific structures and abilities for internal communication may self-select into philanthropic causes. If, for example, some companies tend to use more efficient information channels to communicate disaster donations than donations toward chronic conditions, this may explain difference in coefficients.

Although including the two joint fixed effects help mitigate endogeneity concerns, they are highly restrictive because they absorb a substantial portion of the general variance in our studied relationship. One may argue that any differences in the effects of the type of philanthropic program on labor productivity cannot be understood with static characteristics of the target beneficiary and nonprofit sector. Consequently, with the goal of achieving a balance between credible identification and relevant heterogeneity, we also report specifications with individual fixed effects.

3. Evidence of the Impacts of Philanthropy Towards Welfare Shocks and Chronic Welfare Needs on Productivity

3.1. Baseline Specification

We considered two estimation strategies. We begin by showing the correlations between each type of philanthropy and labor productivity.

Our most stringent OLS specification has the form:

$$(1) \quad \ln(1+\text{labor productivity}_{ft+1}) = \beta_0 + \beta_1(\text{welfare-restitution philanthropy}_{ft}) + \beta_2(\text{welfare-enhancement philanthropy}_{ft}) + \beta_{3,4,5,6,7}(\text{time-varying covariates})_{fbs} + \mu_f + \kappa_i + \rho_s + \nu_t + \gamma_{fb} + \delta_{fs} + \varepsilon_{fbsit}$$

where f is firm, i is industry, b is the beneficiary city, s is the sector or event, and t is year. We lag the predictors to the previous year to ensure that donations occurred before the reported labor productivity, consistent with prior research exploring the effects of corporate philanthropy (e.g., Cuypers et al. 2016, Wang and Qian 2011).

3.2. Treatment-Control Construction and Effect Identification by Philanthropic Program

Our second estimation strategy seeks to produce information that allows us to better identify the marginal effect of each philanthropic program on labor productivity. Estimating the causal impact of each type of philanthropy on labor productivity requires finding credible comparison groups to serve as counterfactuals for the financial statement of companies that either engage in a different philanthropic giving or do not donate. Finding such counterfactuals is complex given the uniqueness of the firm- and context-level factors that explain revenue and employment over time. Even in presence of pervasive isomorphic forces within industries (Marquis and Tilcsik 2016), the frequency and magnitude of corporate philanthropy varies substantially across firms.

We apply the following approach to facilitate causal inference. First, we produce matched comparison exercises where the treatment group is donors to negative welfare shocks and the control groups are either donors to chronic welfare needs or non-donors. We construct a panel of firm financials spanning 2000 to 2019 and then apply inverse propensity score weighting (Hirano et al. 2003) with a vector of company characteristics including revenue, employees, return on assets (ROA), Tobins' q , total assets, R&D intensity, advertising and administrative expenses, consumer orientation⁶, and industry. We choose this technique because propensity score weighting considers the full sample as a pool of controls instead of a

⁶ Consumer orientation is a binary variable that takes value '1' if the company's main activity is distributing goods directly to consumers and '0' if the firm supplies to other companies.

one-to-one match, which increases statistical power. Our specification restricts to firms whose scores lie inside the range of propensity scores, the *common support*. After finding suitable matches, we run differences-in-differences specifications of the following form:

$$(2) \quad \ln(1+\text{labor productivity}_{ft+1}) = \beta_{0=t0} + \beta_1(t0.T) + \mu_f + \kappa_i + \rho_s + \nu_t + \varepsilon_{fbsit}$$

4. Main Results

4.1 Results for Baseline Specification

Table 2 shows the association between the engagement in the type of philanthropy, with no donation being the baseline category, and marginal labor productivity. The partial models, available in the online Appendix, show coefficients that are economically substantial, and they survive the integration of controls. Overall, the higher increase in labor productivity for cases of firms that donate to negative welfare shocks vis-à-vis firms that donate to chronic conditions ranges from 12 to 78 percentage points. Controlling for Firm \times Beneficiary and Firm \times Nonprofit Sector fixed effects, plus separate industry and time fixed effects, and the vector of time-varying covariates, donors to welfare shocks are likely to observe increases of 3.8 percent in labor productivity, on average. In this most stringent specification, the effect of philanthropy towards chronic conditions is not sizable.

4.2. Results for Treatment-Control Specification

The differences-in-differences estimates show similar patterns, displayed in Table 3. The results for Model 1 indicate that philanthropy towards welfare shocks is associated with average differences in labor productivity of 7.54 percent when compared with counterfactual cases with no philanthropic giving. The results for Model 2 show that donations towards welfare shocks are associated with 6.63 percent greater increases in marginal labor productivity when compared with cases of firms supporting chronic conditions.

[INSERT Tables 2 and 3 ABOUT HERE]

5. Robustness

We perform several robustness checks for our main specification. First, we assess the responsiveness of the studied relationship to donation magnitude to explore whether the significance of the effect depends on how much the firm donates. To test this, we construct a continuous predictor, $\ln(1 + \text{donation amount}_{ft})$, by adding the U.S. dollar amounts for each type of philanthropy in a given firm-year.⁷ For donations towards chronic conditions, we also calculate donation subtotals for each of the 14 NTEE sectors. Table 1 in the Appendix shows qualitatively similar results that philanthropic support of welfare loss yields substantially greater effects on labor productivity than support of chronic needs. The coefficient for philanthropy towards chronic conditions is statistically insignificant.

As evident in the descriptive statistics in Table 1 in the main document, the proportion of zero donation amounts is large across time. To account for the concern that the results are sensitive to the operationalization of the continuous predictor, we add 0.01 or 0.1 to donation amounts (instead of 1) before log transforming the variable. In Table 2 in the Appendix, we find that the results are robust to rescaling. Separately, we run models with the square of $\ln(1 + \text{donation amount}_{ft})$ to evaluate nonlinearities. Although we find a degree of concavity for both types of philanthropy, in unreported results, we observe that the information regarding the stronger positive effect of philanthropy towards welfare loss remains intact. We run an additional test of the effect of large donors by winsorizing at the highest five percent of values in the complete sample of donations. The results in these panels are similar to our main inference (Table 3 in the Appendix).

⁷ In-kind giving or donations reported in currencies other than U.S. dollar are converted using information from similar donations by other companies. In case that this information is not available, we use current prices in the locality of the target beneficiary. The procedural details are at <https://luisballesteros.net/data-code-appendixes/loss-aversion-corporate-philanthropy-and-labor-productivity/>.

By themselves, the evidence in these tests have important implications for the understanding of the strategic value of corporate philanthropy. Past studies suggest that the financial benefits for the firm rise in donation amounts (Madsen and Rodgers 2015). Our opposite findings that firms accrue benefits regardless of the magnitude of philanthropy align with experimental evidence (Small 2010, Tonin and Vlassopoulos 2015) and more contemporaneous archival-data work (Ballesteros et al. 2018). There are two potential explanations for this difference. First, our dataset allows us to measure the distribution of outcomes across non-donors, a sample that often is missed in extant work, better mitigating selection bias. Second, the longitudinal nature of our dataset allows us to control for omitted-variable bias and address self-selection issues. Past work analyzes an event or a few events triggering company donations.

Finally, as additional validation of the isolation of effects of philanthropy on labor productivity, we drop all the cases for which we have information that the company implemented changes in management, technology, and organizational structure. For the first two sources of potential confounders, we run Boolean searches in Python using the full sample of companies. The search range was from 2005, two years before the observation period to 2019. We find 14 cases of companies that implemented innovations or changes to the production line and 19 cases of changes of CEO or executive-level managers that could have resulted in productivity changes. For the case of contaminating events that come from modifications of the organizational structure, we rely on Bureau van Dijk's Orbis to track changes in ownership percentage over between 2005 and 2019. We used information on subsidiary incorporation dates and legal changes from the Orbis database to code when subsidiaries entered or exited the multinational firm group. A total of 13 of the sample firms had mergers or acquisitions during our sample period. We obtain qualitatively similar results with the adjusted database. The correspondent tables are in the online Appendix.

6. Discussion and Conclusion

A key concern for firm leaders is how to motivate employees via prosocial behavior, as similarly reflected in growing scholarly attention to how firm prosocial behavior can improve employee-related outcomes

(Bode et al. 2015, Flammer 2015, Flammer and Kacperczyk 2019, Flammer and Luo 2016). Yet while studies increasingly suggest that firms which engage in philanthropy motivate employees more than firms that do not (Burbano 2016, 2019, Cassar and Meier 2018, Jones et al. 2014, Tonin and Vlassopoulos 2015), to date, research has largely not explored whether firm philanthropy has differential effects on labor productivity depending on the societal causes firms support. Our study offers an important distinction between philanthropic programs by drawing on research findings in social psychology that show individuals hold preferences for victims of loss over victims experiencing chronic misfortune (Small 2010, Sudhir et al. 2016, White et al. 2012). Extending these insights to the organizational realm, we argue that corporate giving towards welfare loss is more likely to enhance employees' satisfaction and thus yield greater increases in labor productivity compared to corporate donations towards chronic welfare needs. We present evidence consistent with our prediction in a longitudinal sample of U.S. firms.

Our research advances understanding of the relationship between corporate philanthropy and labor productivity. In showing that firms which engage in philanthropy, compared to firms that do not, experience greater productivity, our findings provide evidence with longitudinal administrative data that echo existing experimental research (Burbano 2016, Cassar and Meier 2018, Tonin and Vlassopoulos 2015). We also expand upon existing work by providing evidence that corporate philanthropy yields greater employee productivity when it targets negative welfare shocks compared to chronic conditions, thus offering a more nuanced understanding of the relationship between corporate philanthropy and labor productivity.

We hope our research encourages future work on variation in labor outcomes resulting from different forms of firm prosocial behavior, both corporate philanthropy and beyond. Regarding philanthropy, our results are consistent with the idea that evidence in social psychology—namely, that people prefer to donate toward victims of loss than those affected by chronic conditions (Small 2010, Sudhir et al. 2016)—can be extended to individuals' preferences of their firms' philanthropic programs. However, future research is necessary to fully isolate the effects of alternative mechanisms, such as sympathy and judgments of deservingness (Small 2010). It would similarly be fruitful for future research, particularly experimental

work, to investigate how different forms of prosocial behavior impact alternate measures of labor productivity.

We note that is not our intention to suggest that firms should abandon supporting chronic issues, and indeed we find that supporting chronic issues does increase labor productivity. Still, taking our results together with related research (Ballesteros et al. 2017, Ballesteros and Magelssen 2020) supports the idea that firms may be uniquely positioned to address costly disasters that increasingly overwhelm governmental capacity and traditional relief efforts while also enhancing their own economic standing.

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Table 1. Descriptive Statistics

Variables	Observations	Mean	Standard Deviation	Min	Max
<i>Panel A. Firm</i>					
Labor Productivity	507	884.22	2,204.69	0	56,195.94
Market Capitalization (ln)	507	16.78	1.55	10.40	22.11
R&D Intensity	507	2.93	4.61	-0.20	45.38
Advertising and Admin Expenses (ln)	507	14.88	1.53	9.20	18.60
Return on Assets	507	4.27	5.63	-43.79	36.06
Tobin's q	507	0.86	0.97	0	11.44
Total Assets	507	16.78	1.56	10.40	22.11
Consumer Orientation	507	0.46	0.50	0	1
Donor fatigue	507	0.06	0.59	0	14
Reputation	507	0.09	0.36	-1	1
<i>Panel B. Beneficiary City</i>					
GDP (PPP current international) (ln)	136	15.09	1.38	19.10	30.60
Population (ln)	136	5.95	2.06	10.86	21.04
Urban population (% of total population)	136	73.92	23.43	10	100
Control of Corruption	136	1.07	0.89	-2	2
<i>Panel C. Sector or Event</i>					
Donation Publicity	414	1.80	2.01	0	13.29
Event Publicity	414	9.24	3.56	0	18.50
Number of Beneficiaries (ln)	414	4.64	4.55	0	18.26
Economic Need (ln)	414	3.89	3.84	0	12.25
<i>Panel D. Firm-Sector</i>					
Philanthropy (USD Million)	501,115	2.97	7.72	0	75.35
Welfare-shock donations (US Mill, donors)	1,950	9.18	4.07	.50	54.43
Chronic-conditions donations (US Mill, donors)	3,050	4.30	34.90	.10	1,140

Notes: Each subheading provides the level of aggregation of the data presented in that part of the table. Panel A provides summary statistics for our analyses based on the dataset of the 500 largest U.S. firms by revenue in 2019. Panel B provides statistics for the beneficiary city or location of company philanthropy in the sample period 2007-2019. Panel C shows information on 414 potential donation events: including donations to 232 major welfare shocks (i.e., epidemics, natural disasters, and terrorist attacks) and 182 potential donations events to chronic conditions (i.e., the 14 identified NTEE nonprofit sectors). Panel D shows statistics for the independent variable. Welfare shock donations are towards the relief and recovery of the identified epidemics, natural disasters, and terrorist attacks. Chronic needs donations are directed towards at least one of the NTEE sectors. Please see the text for further details on variable definitions and construction.

Table 2. Type of Philanthropic Program and Labor of Productivity

Variables	Labor Productivity (ln)			
	(1)	(2)	(3)	(4)
Welfare-Shock Philanthropy	0.099*** (0.037)	0.055*** (0.013)	0.068*** (-0.004)	0.038*** (0.002)
Chronic-Conditions Philanthropy	0.021* (0.012)	0.037* (0.021)	0.024** (0.011)	0.027 (0.497)
Controls				
Firm, Beneficiary City, and Nonprofit Sector Time-Varying Controls	YES	YES	YES	YES
Fixed Effects				
Firm	YES	NO	NO	NO
Industry	YES	YES	YES	YES
Beneficiary City	YES	NO	NO	NO
Nonprofit Sector	YES	NO	NO	NO
Year	YES	YES	YES	YES
Firm × Beneficiary City	NO	YES	NO	YES
Firm × Nonprofit Sector	NO	NO	YES	YES
Observations	209,898	204,708	209,898	204,708

Notes: This table reports regression estimates for the relationship between the type of philanthropic program and labor productivity. Welfare-shock philanthropy is directed towards the relief and recovery of the identified epidemics, natural disasters, and terrorist attacks. Chronic-conditions philanthropy is directed towards at least one of the NTEE sectors related to societal welfare. Please see the text for further details on variable definitions and construction. The firm panel is the largest 500 U.S. companies by revenue in 2019. There are 414 potential donation episodes. The sample period is 2007-2019. Robust standard errors are clustered by company and reported in parentheses, indicating *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 3. Differences-in-Differences Estimates of the Effect of the Type of Philanthropic Program on Labor of Productivity

Variables	(1) Treatment: Welfare-Shock Philanthropy Control: No-Donors	(2) Treatment: Welfare-Shock Philanthropy Control: Chronic- Conditions Philanthropy
Labor Productivity	0.075*** (0.025)	0.066*** (0.024)
Firm, Beneficiary City, and Nonprofit Sector Time-Varying Controls	YES	YES
Firm, Industry, Beneficiary City, Nonprofit Sector Year- Fixed Effects	YES	YES
Observations	204,708	204,708
R-squared	0.79	0.81

Notes: This table reports differences-in-differences estimates comparing the labor productivity of a treatment group and a control group. Treatment is donating toward the relief and recovery of shocks that created welfare losses. The control group in Model 1 are firms that do not donate to any philanthropic program in the comparison year. The control group in Model 2 are firms that donate toward improving chronic welfare needs according to the 14 NTEE sectors related to social welfare. Please see the text for further details on variable definitions and construction. The firm panel is the largest 500 U.S. companies by revenue in 2019. There are 414 potential donation episodes. The sample period is 2007-2019. Standard errors are clustered by company and reported in parentheses, indicating *** p<0.01, ** p<0.05, *p<0.10.