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Fair Choices during COVID-19: Firms' Altruism and Inequality Aversion in Managing a Large Short-Time Work Scheme

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Tommaso Nannicini

Fair Choices during COVID-19: Firms' Altruism and Inequality Aversion in Managing a Large Short-Time Work Scheme

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Fair Choices during COVID-19: Firms' Altruism and Inequality Aversion in Managing a Large Short-Time Work Scheme

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Leveraging a unique dataset encompassing choices made by the entire universe of Italian manufacturing firms regarding a short-time work scheme (STW), we investigate the impact of the pandemic's relative local severity on firms' altruistic tendencies and preferences towards inequality. We use the decision to advance income support payments to workers as a measure of firm altruism and the choice concerning the concentration of STW working hours among the workforce as a gauge of inequality preferences. Adopting a natural experiment-like approach, we find that, controlling for regional and industry fixed effects, in areas more severely hit by the pandemic firms were more likely to advance the STW payment to their employees and to opt for a lower STW concentration. The effects we find are larger for firms characterized by more intense ties between entrepreneurs and workers, suggesting that the pandemic has mainly enhanced parochial pro-social behaviour.

Keywords: COVID-19; altruism; inequality aversion; labour market; firm dynamics

JEL CODES: D22; D91; I14.

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Scelte eque e pandemia da COVID-19: Altruismo e avversione alla disuguaglianza delle imprese nella gestione della Cassa Integrazione Guadagni

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Utilizzando un set di dati che comprende le scelte effettuate dall'intero universo delle imprese manifatturiere italiane nel ricorso alla Cassa Integrazione Guadagni (CIG), indaghiamo l'impatto della pandemia a livello locale sulle tendenze altruistiche delle imprese e sulle preferenze verso la disuguaglianza. Utilizziamo la decisione di anticipare i pagamenti per il sostegno al reddito dei lavoratori come misura dell'altruismo delle imprese e la scelta di concentrare le ore di lavoro in CIG tra la forza lavoro come indicatore delle preferenze per la disuguaglianza. Adottando un approccio simile a quello di un esperimento naturale rileviamo che, controllando per gli effetti fissi regionali e di settore, nelle aree più duramente colpite dalla pandemia le imprese avevano maggiori probabilità di anticipare il pagamento della CIG ai propri dipendenti e di optare per una minore concentrazione della CIG. Gli effetti riscontrati sono maggiori per le imprese caratterizzate da legami più intensi tra imprenditori e lavoratori, il che suggerisce che la pandemia ha potenziato soprattutto i comportamenti pro-sociali a livello locale.

Parole chiave: COVID-19; altruismo; avversione alla disuguaglianza; mercato del lavoro; imprese

JEL CODES: D22; D91; I14.

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Fair Choices during COVID-19: Firms' Altruism and Inequality Aversion in Managing a Large Short-Time Work Scheme

1. Introduction

The COVID-19 pandemic exposing individuals to unprecedented stress and uncertainty has changed numerous domains of their lives. This exceptional global crisis has sparked widespread interest among researchers, resulting in a substantial and growing body of literature. One significant area of investigation within this research is focused on understanding the extent to which the pandemic has impacted interpersonal relationships, pro-social behaviors, and attitudes toward inequality.

The existing literature has predominantly focused on individuals' reactions, leaving a notable gap in our understanding of how firms have responded. However, news reports from the press indicate that many organizations, driven by the principles of corporate social responsibility, have taken significant steps to provide support to communities and alleviate the financial hardships faced by their employees due to the pandemic (Bapuji et al., 2020; Guerrero et al., 2020). Examples include notable donations made by prominent companies like Google, Facebook, Cisco, Netflix, and Microsoft, which have contributed substantial amounts to contrast the COVID-19 outbreaks (as reported on the Statista website).[1] This evidence suggests a potential shift in the way firms pursue their objectives and demonstrate commitment to society and vulnerable groups, particularly those closest to them. Nevertheless, existing research in this area lacks robust and systematic evidence, underscoring the importance of further investigation to gain comprehensive insights into how the pandemic has impacted firms' behaviors and their approach to corporate social responsibility.

In this paper we investigate the Italian case, which was the first Western country to be hit by the pandemic and one of the countries in the world with the highest death tolls from COVID-19. We focus on choices made by Italian firms during the first wave of the pandemic in managing the main policy tool adopted by the Italian government to support employment retention: the extension to almost all firms of a short-time work (STW) scheme, "Cassa Integrazione Guadagni", originally targeted to medium and large industrial firms facing transitory demand or production shocks.[2] In using this scheme firms had to make two important choices that offer insights into their altruism towards employees and their aversion to inequality. The first choice pertained to the firm's option to advance income support payments to workers or to have the social insurance agency handling the payments directly. Advancing payments allowed workers to receive support promptly, while payments handled by the agency involved waiting for potentially extended administrative procedures. This decision is viewed as an indicator of firm altruism since it directly impacts the financial well-being of workers, especially those facing financial constraints. However, it also presents a financial burden for the firm, further amplified by the significant business uncertainty brought on by the pandemic. The second choice considered the distribution of short-time work among employees. Being placed under the STW scheme meant a wage reduction of at least 20% for workers,

[1] See for more details the Statista webpage: https://www.statista.com/statistics/1106386/leading-tech-companies-donations-towards-covid-19/

[2] There has been a massive increase in the SWT during the pandemic: just in April 2020 more than 800 million hours have been authorized, while in 2019 the month average was around 10 million.

along with the loss of various benefits like performance-related bonuses and overtime work. Furthermore, being under the STW scheme could result in a loss of career and training opportunities due to reduced contact with the production environment. On the other hand, commuting to work and interacting with coworkers increases the risk of contagion. Since there was insufficient information about which groups were more negatively affected by the virus, at least at the beginning of the pandemic, all workers wanted to protect themselves. A firm with a preference for equity would choose to distribute both the economic costs and health risks associated with the pandemic evenly among all workers. The decision to either distribute the wage loss equally among all employees or concentrate it on specific individuals have significant implications, as it determines who bears the costs. The Herfindahl Hirschman Index is used to measure the within firm concentration of short-time work and is treated as a proxy for the firm's attitudes toward inequality. We test whether the severity of COVID-19 pandemic at local level has increased firm altruism and accentuated concerns about inequality in society. Given the global nature and scale of the crisis, it is likely to influence pro-social behavior and inequality aversion through various channels. The pandemic might have heightened empathy among individuals facing the same global threat, leading to an increase in altruistic behaviors and the flourishing of solidarity initiatives (Brandt et al. 2020; The Left, 2020). Additionally, the fear of succumbing to the pandemic may have fostered a sense of interdependence and activated reciprocity mechanisms (Cassar et al. 2017). On the other hand, concerns about deteriorating economic conditions and health might have induced more self-regarding attitudes, while stress and anxiety could have triggered selfish instincts. Likewise, the pandemic has generated divergent effects on inequality preferences. On one hand, it has accentuated concerns about inequality in society, highlighting the importance of factors beyond individual control in determining life outcomes and reinforcing existing inequalities (Pinsker, 2020). Conversely, pandemic times have witnessed a potential acceptance of inequality, possibly driven by an emphasis on precautionary behaviors and individual responsibility for risk reduction (Cappelen et al. 2021)[3].

Then, from a theoretical point of view it is not clear whether exposure to natural threats, such as a pandemic, is associated with an improvement in pro-sociality. The empirical evidence is also inconclusive. While research based on natural disasters finds an increase in pro-sociality, the evidence on the impact produced by the COVID-19 contagion is less clear cut, with some works pointing to a positive effect (Adena and Harke,2022; Shachat et al. 2021; Grimalda et al. 2021; Cappelen et al. 2021) and other showing negative or null effects (Brañas-Garza et al. 2020; Lohmann et al. (2020).

To shed additional light on these issues we leverage a unique dataset encompassing the universe of Italian manufacturing firms to explore their pro-social behavior and attitudes towards inequality during the COVID-19 pandemic. We observe various firm characteristics, including size, location, and sector, as well as employee features like the proportion of blue-collar workers, workers on temporary contracts, and part-time employees.

Our identification strategy relies on the exogeneity, with respect to firm and worker characteristics, of the local COVID-19 impact across local areas in Italy, with some local market areas (LMAs) experiencing significantly higher mortality rates than others during the initial months of the pandemic. To be conservative, we make use of milder assumption, i.e. that the distribution of the local COVID-19 impact is exogenous once controlling for the industry production structure, i.e. some industries have been forced to shut down during the first wave of the pandemic and industries might have reacted differently to the COVID-19, and for regional heterogeneity, since

[3] This is another crucial difference with respect to natural disasters, where in most cases individual behavior does not play a big role in avoiding the extreme event and its consequences.

the governance of the health system is settled at this local level. Hence, our baseline regressions include interactions of industry (2 digit) and regional fixed effects, and hence our results are identified within an industry-region dimension, across firms that have the same production structure and regional location. Baseline regressions also include non-parametric controls for the effective use of SWT by firms and hence identification is derived comparing firms with the same use of the program (results do not change removing these controls).

By capitalizing on this exogenous variation, we investigate whether firms in areas more severely affected by the pandemic exhibited higher levels of pro-social behavior and a stronger emphasis on equity issues. The underlying mechanism is that the local impact of COVID-19 in these regions was more palpable to firms due to direct personal connections with individuals (relatives, friends, colleagues, acquaintances) experiencing the severe effects of COVID-19 contagion. Crucially, we ensure that our identification assumption holds by testing that all predetermined firm and worker characteristics are not systematically related to local excess mortality, verifying the random spatial distribution of the pandemic's impact. Further, in additional specifications we control for firm and workforce characteristics (firm size, share of blue and while collard, share of part time and temporary workers, average worker seniority in the firm, and teleworkability) and for local labour market characteristics (activity rate, unemployment rate, share of tertiary educated, population density, a proxy of social capital) to distil the effects of local severity that are not related to economic channels or expectations.

Our estimates show that in areas where the COVID-19 pandemic had a higher severity, firms were more likely to advance the payment of STW to their employees, providing financial relief in a timely manner. Additionally, they opted for a lower concentration of short-time work among their workforce, potentially distributing the impacts of the crisis more evenly. A standard deviation increase in excess mortality entails an increase of around 2 percentage points in the probability of advance payment, with respect to an average of 40% (4% increase). A smaller but still not negligible impact is detected for inequality aversion: a standard deviation increase in excess mortality generates a 0.2 decrease of the HHI (equivalent to a 1.5% reduction relative to the average HHI of 12.6).

We make use of the methodology proposed by Oster (2019) to investigate further the potential role played by unobservables, and findings are highly reassuring: even in more extreme scenarios we derive a high stability of coefficients with respect to a potential omitted variable bias.

Furthermore, we recognize that firm liquidity and productivity might play a role in shaping our results. Firms more exposed to COVID-19 could be located in areas with fewer liquidity constraints or better firm dynamics, potentially biasing our findings. To account for this, we merge our administrative data with balance-sheet data available for limited liability companies. Our results remain consistent even after controlling for these variables, providing further confirmation of our findings.

Overall, we find that the impact of excess mortality on our outcome variables remains stable across various specifications and the inclusion of additional covariates does not significantly alter the coefficient of interest. Under the assumption that unobservable factors may be correlated with observable variables, as supported by Atonji et al. (2005) and Oster (2019), we are confident that potential biases from unaccounted factors in our regressions are minimized, and our results can be considered reliable and robust, confirming the exogeneity of the local variations in the local COVID-19 impact.

We also explore whether the local threat of COVID-19 has influenced "general altruism", towards humanity as a whole, or "parochial altruism", directed towards individuals perceived as belonging to the same group (Choi and Bowels, 2007, Mironova and Whitt (2021) among others). To deal with this issue we examine whether the effect

of the pandemic on firm pro-sociality varies depending on the strength of in-group relationships between entrepreneurs and workers, which we proxy using both worker seniority in the firm and firm size. Our findings suggest that the impact of excess mortality on the probability of the firm advancing the payment of income support is more pronounced when the average worker's seniority in the firm is longer, i.e. in firms with stronger and more established in-group relationships the pandemic has heightened pro-social behavior. As for firm size, we observe larger effects in smaller firms, where daily face-to-face interactions are more common, leading to stronger ties between entrepreneurs and workers, i.e. also in this case supporting parochial altruism.

This paper contributes to the existing research on the impact of the COVID-19 pandemic on pro-social behaviors and inequality aversion, which has been poorly explored to date. As previously mentioned, there are just a few studies examining the relationship between the pandemic and pro-sociality and attitudes toward inequality and their results are mixed.

More broadly this paper speaks to the large literature investigating the impact of extreme circumstances on individual preferences and behavior. Some of these studies rely on experiments and consider individual response to laboratory-induced stress, while others consider how exposure to a major life shock (e.g., severe injury, death in the family, natural disasters, war, financial crisis) affects, either temporarily or permanently, individual preferences. In this vein a number of papers analyze charitable giving in the aftermath of natural disasters (Strömberg, 2007; Eisensee and Strömberg, 2007; Jayaraman et al., 2021; Scharf et al., 2022; Brown and Minty, 2008), while others have looked at the effects of these shocks on different measures of social preferences (Castillo and Carter, 2011).

Our contribution to the literature is threefold. First, to the best of our knowledge we provide the first evidence on how pro-social preferences of entrepreneurs are affected by an exogenous global and unexpected shock such as the COVID-19. While the idea of firms behaving altruistically and having preferences might seem unusual with respect to profit-maximizing strategies, as it implies a personification of firms beyond the scope of Corporate Social Responsibility, we believe that the notion of firms incorporating the well-being of workers into their utility is a valuable perspective. This is particularly relevant in the Italian context, where the majority of firms are small and decisions are often made by individual entrepreneurs. Moreover, the unique context of the early months of the pandemic should not be underestimated. The unprecedented challenges and uncertainties faced by firms during this period may have prompted many to prioritize the welfare of their workers and communities, even at the expense of short-term profits. This crisis-induced altruism might reflect a temporary shift in priorities, driven by the need to navigate through an extraordinary situation. Second, we base our analysis on measures describing actual behaviors which have important implications for entrepreneurs and workers, while most of the existing studies analyze the effect of the COVID-19 crisis on pro-sociality by means of self-reported measures of pro-sociality, often obtained from surveys asking subjects about their preferences or by means of incentivized task involving small amounts of money. In addition, our data, pertaining to the universe of firms operating in the Italian manufacturing sector, do not suffer from self-selection biases that might affect studies relying on surveys as individuals who decide to answer might share peculiar characteristics. Finally, our paper contributes to a better understanding of the effects of extreme circumstances on pro-sociality and attitudes toward altruism and inequality aversion, and it is particularly relevant as they might play a crucial role in complementing governments' initiatives to support people in need.

The paper is structured as follows. Section 2 describes the institutional setting, the data and the descriptive

analysis, while Section 3 focuses on the empirical specification. Section 4 presents the main results, and Section 5 some robustness checks. Section 6 investigates the impact on the potential mechanism focusing on parochial altruism, while Section 7 concludes.

2. Institutional background and data

2.1 Institutional background

Italy has been the first Western country to be hit by the pandemic and one of the countries in the world with the highest death tolls from COVID-19. To limit the transmission of the virus the Italian government opted for a nation-wide lockdown (in the months of March and April) and forced non-essential economic activities (around 50% of the workforce) to suspend temporarily their business. Besides these limitations, the Government introduced massive economic policies aimed at assisting affected firms, workers, and households. One of the key measures was the extension of a STW scheme, originally intended for medium and large industrial firms facing temporary demand or production shocks.

The STW scheme, which has been in use in Italy since 1941, serves to stabilize employment and income during economic crises. When a demand or production shock occurs, firms can request income support from the government through the STW scheme, allowing them to retain their workforce in the short term without permanent job losses.[4] Firms declare the number of working hours to be covered by the government, and they must decide the proportion of workers to place on STW, with each worker's time in STW being either partial (less than 100% of workable hours) or total (100%). Workers on STW experience a wage reduction of at least 20% of their basic wage. Further, in addiction to wage penalty set by law, a worker in SWT does not receive any overtime and performance pay wage component.

During the COVID-19 pandemic, the eligibility criteria and procedures for accessing STW were broadened, regulations were streamlined, and contribution fees were suspended. Virtually all Italian firms, regardless of their sector, economic conditions, or size, were granted access to STW coverage, making it more widely available. As a consequence, and also due to the fact that layoffs were banned, the usage of STW witnessed a significant surge, with over 4 billion hours allowed in 2020, marking a 1467% increase compared to 2019.[5]

In this simplified setting firms were able to freely decide whether to pay the income support to their workers in advance or to request payment through the social insurance agency, and whether to concentrate STW hours on a few workers or distribute them more widely among a larger group, affecting the level of redistribution within the company.[6] As previously mentioned, the former option was generally more beneficial for workers on STW, as it

[4] Cassa Integrazione Guadagni Ordinaria (CIGO) and Cassa Integrazione Guadagni Straordinaria (CIGS) were the two main programs in place before the COVID-19 pandemic. The first referred to firms suffering a temporary reduction of activities, operating in the manufacturing and construction sectors, while the second was oriented to firms operating in same specific sectors and facing situations of plant restructuring, production reorganization, prolonged crisis or bankruptcy. Additionally, Fondo di integrazione Salariale (FIS) was aimed at addressing firms not covered by the ordinary schemes already mentioned, in same specific sectors.

[5] For sake of comparison, it is worth mentioning that the peak in the STW use was in 2010, with 1,2 billion of authorized hours.

[6] Note that under the pre-COVID rules, the support provided under the Short-Time Work (STW) scheme was paid directly by the firm to the worker unless the firm could demonstrate liquidity constraints.

ensured a timely receipt of support, coinciding with their standard wage payments, while the latter involved waiting for administrative procedures to be completed.

2.2 Social Security Administrative Data and Variable Definitions

To address our research question, we use a unique dataset obtained from INPS, which includes comprehensive information on STW payments made during the COVID-19 pandemic. This dataset covers all STW flows,[7] offering detailed insights into the number of STW hours for each worker by firm, the payment period, and the payment channel (advance payment by the employer or payment by INPS). Using this information, we compute the monthly amount of STW hours for each worker and then aggregate this information to determine the monthly amount of STW hours for each firm. We restricted our sample to firms operating in the Manufacturing sector, with at least one hour of STW during the period going from March 2020 to June 2020.

We merge this archive with INPS employer-employee data on the universe of workers and firms in the private sector, which allows us to obtain granular information for each worker on job and employment characteristics (total amount of workable hours based on the employment contract, type of contract, qualification, firm size, sector of activity at 2-digit level, etc.). We use this information at worker level to compute a number of variables describing the workforce composition of each firm (share of blue-collar workers, average workers' seniority, proportion of part-time workers, proportion of temporary contracts)[8], which we consider as control variables that may influence the outcome variables. We also incorporate in our model a variable (Teleworkability) derived from a survey conducted by the National Institute for the Analysis of Public Policies. This index, ranging from 0 to 100, proxies for the feasibility of remote working across various industries (four-digit industry level).[9]

A crucial control variable is the effective use of the Short-Time Work (STW) scheme at the firm level during the period under investigation, which we calculate as the ratio of the total amount of STW hours used by a firm's employees to the total amount of workable hours by the same employees during March-April 2020.

We also use data from ISTAT Territorial Statistics providing information on the following variables computed at the LMA: average population size, activity rate, unemployment rate[10], share of resident population with tertiary education, population density (thousands per squared kilometer), share of workers employed in non-profit activities as a proxy for social capital.[11]

[7] We do not use data on authorized hours, since we are interested in the hours in SWT effectively used by firms and workers, and this information is provided by data on payments.
[8] All these variables are computed in 2019, and hence are predetermined with respect to the period under analysis.
[9] Details on INAPP data are available at https://oa.inapp.org/xmlui/bitstream/handle/20.500.12916/661/Inapp_Barbieri_Basso_Scicchitano_Italian_Workers_Risk_During_Covid_19_Epidemic_2020.pdf?sequence=2&isAllowed=y
[10] Activity rate and unemployment rate are computed for 2019 based on the information provided by ISTAT; data available at https://www.istat.it/it/archivio/248606
[11] Data are provided by ISTAT at the LMM level based on the 15th Census of population and households,2011. Available at https://www.istat.it/it/informazioni-territoriali-e-cartografiche/sistemi-locali-del-lavoro/risultati-dei-censimenti-per-sistema-locale-del-lavoro. Data on workers employed in non-profit activities are also from the 15th Census of population and households.

To further control for additional firm characteristics such as productivity and liquidity[12], we link our data with firm-level balance-sheet information from CERVED registers. Productivity is the computed as the ratio between Value Added (expressed in thousands of euro) and the number of contracts activated by the company in the reference year. Liquidity, expressed in thousands of euro, is derived by CERVED register without further manipulation). Unfortunately, this information is available only for limited liability firms, so we use it for robustness checks rather than in the baseline specification.

We consider two outcome variables. The first variable pertains to the channel of payment for the STW scheme. We create a dummy variable that takes a value of 1 if at least one hour of STW was directly paid by the employer and 0 if the payment was made by INPS. We take into account the entire population of STW recipient firms, without imposing any size restrictions, resulting in a sample of 177,071 firms. The second outcome variable focuses on the STW concentration among workers within each firm. We measure this concentration using the Herfindahl-Hirschman Index (HHI), which is computed at the firm level by summing the squared shares of STW hours, shares computed as the ration between the hours in SWT for a given worker over the entire hours of SWT used by the firm.[13] As the STW concentration index might be less representative for small firms due to their limited number of employees, making it more likely that all of them are involved in the STW scheme, for the analysis of this outcome variable we focus on firms with more than 10 employees that have used at least one hour of STW[14], resulting in a reduced sample size of 63,137 firms.

It is worth noting that for the two outcome variables we extend the computation period from March-April to March-June 2020, since the impact of the lockdown in March and April affects decisions to undertake the SWT also in the following months. In particular, the "Cura Italia" Decree (March 2020) financed STW scheme to be used by firms for a maximum of 9 weeks until 31st august 2020, and hence firms' decision about STW usage were planned over a time span of several weeks.[15]

Our preferred level of analysis concerns the LMAs, instead of municipalities, since LMAs captures the overall impact of COVID-19 severity on firms by considering not only what happens within the immediate vicinity of a firm (within the municipality where the firm is located) but also accounts for fatalities in the surrounding municipalities. This is particularly relevant for firms situated in small municipalities (69% of Italian municipalities has less than 3,000 inhabitants).[16]

The impact of the local severity of the COVID-19 pandemic in then proxied by the Excess Mortality (EM) at the LMAs. EM is computed as $(D_{t2}-D_{t1})/D_{t1}$, where D_{t2} is the number of deaths (all ages, all causes) registered in each LMA during the period March-April 2020 and D_{t1} is the mean number of deaths registered in the same LMA during the same months in the period from 2015 to 2019 (ISTAT data[17]). This approach allows us to capture the impact of the pandemic outbreak, taking into account both the direct and indirect effects of COVID-19 contagion (not only deaths directly attributed to the virus but also deaths due to problems of treatment, surveillance etc. arising from the pressure on the health system during the pandemic). We specifically focus on the period of March

[12] The variables are taken at the last available year, that is 2018.
[13] Only for the HH sample we drop from the analysis the observations with a monthly ratio between STW hours and total workable hours higher than 0.95 in a given month, since for these firms it is not possible to increase the HHI index in that month.
[14] The number of workers is proxied by the number of contracts in the firm in the period.
[15] We exclude summer months of 2020 since the effective use of STW strongly decreased in summer.
[16] For each firm, the municipality of reference is the one in which the economic activity takes place, according to information derived from individual labour contracts in the period March-April 2020; in case of firms active in several municipality, the reference is the modal one. To have data at the LMM level we collapse data from the municipality level.
[17] Daily deaths by municipality, gender and age class available at https://www.istat.it/it/archivio/240401

and April 2020, which corresponds to the lockdown period in Italy, characterized by high emotional pressure and significant disruptions, and at the same time by the same policy rules in all the Italian regions[18]. To further ensure the robustness of our findings, we also consider an alternative measure of excess mortality that specifically focuses on individuals aged 70 or older, who have been particularly affected by the pandemic. Municipality level data are used as well as robustness.

Even if both EM and STW refer to the months of March and April, it has to be considered that firm decisions to ask for the authorization of the STW are taken in March and April, but since it takes time to be authorized the effective massive use of the STW has started by the end of April and in the following months. For this reason, the actual use of the STW cannot be a driver of the EM at the local level in the months of March and April[19].

It is also to be said that the excess mortality indicator calculated for the period March-April 2020 shows a very high correlation with the same indicator calculated considering only the month of March (about 0.955 for EM considering all ages, 0.961 for the elderly). Results (not reported and available upon request) remain qualitatively the same when using this alternative measure of EM.

2.3 Descriptive statistics

Table 1 presents descriptive statistics for the two samples used in our analysis. Panel A refers to the Advance Payment sample and includes firms of all sizes. 43% of the firms advance payments to their employees. The excess mortality is significantly high, with a 53% increase at the LMA level in 2020 compared to previous years (56% at the municipality level and even higher when focusing on individuals over 70 years old, both at the LMA or municipality level). STW intensity has an average value of 23% of potential workable hours. The average firm size, measured by the number of contracts, is 20.5, and the average seniority in the firm is 6 years. The share of blue-collar workers is 73%, and there is a considerable percentage of temporary contracts (18%) and part-time workers (19%). The sample size decreases to 113,929 observations when considering balance sheet variables.

The lower panel of the Table presents descriptive statistics for the HHI dataset, including only firms with more than 10 employees. The Herfindahl-Hirschman Index (HHI), taking values from 0 to 100, has an average value of 12.63. Excess mortality is even higher compared to the Advance Payment sample, with a 64% increase in mortality at the LMA level in 2020 compared to previous years.[20] The control variables show similar patterns to the upper panel.

[18] In the period March-July 2020 the policies adopted by the Government to contrast the COVID widespread have been exactly the same at the National level, with a general and strict lockdown, a list of sectors that could keep on working (and others that had to stop), specific rules establishing those who could go out and for which reason etc. After the summer of 2020 policies become more regionally differentiated, with the Government announcing over time colors associated to regions: from 'red' regions, that had to keep the general lockdown with very restrictive measures, to 'white' regions, where restrictions were much milder. Then, expanding the period of analysis would introduce many confounding factors.

[19] Furthermore, the decision to include both March and April in our baseline calculation of EM is based on the timing of the spread of COVID-19 in Italy. The coverage of both months allows us to include areas that were affected by COVID-19 only a few weeks after the first outbreaks in the country.

[20] It is worth noting that the differences in terms of excess mortality between the two sample is related to the difference in geographical composition; in HHI sample the incidence of firms located in the North of the country is 50%, while in the Advance Payment sample is 42%.

Table 1. Summary statistics of the Advance Payment and STWHHI datasets

Advance payment dataset

	Mean	Std. Dev.	Min	Max	Obs
Advance Payment	0.434	0.496	0.000	1.000	177071
Intensity	0.229	0.267	0.000	1.000	177071
Excess mortality (municipality)	0.562	0.985	-1.000	22.333	177055
Excess mortality (LMA)	0.531	0.799	-0.396	5.484	177071
Excess mortality 70+ (municipality)	0.622	1.094	-1.000	39.000	177059
Excess mortality 70+ (LMA)	0.579	0.847	-0.458	5.808	177071
Seniority	6.080	5.696	0.000	37.000	177071
Share blue collars	0.734	0.289	0.000	1.000	177071
Share white collars	0.188	0.248	0.000	1.000	177071
Share temporary contract	0.177	0.243	0.000	1.000	177071
Share part time	0.192	0.296	0.000	1.000	177071
Number of contracts	20.447	126.947	1.000	38229.000	177071
Teleworkability	45.674	7.000	34.277	70.448	177071
Labour productivity (thousands)	0.067	0.759	-3.124	139.248	113929
Liquidity (thousands)	0.719	6.701	0.000	676.977	113929
Activity rate - 2019 (%)	50.662	5.971	30.525	63.912	177071
Unemployment rate - 2019 (%)	9.938	5.770	1.194	36.187	177071
Population density	0.667	0.760	0.009	3.099	177071
Share of population with tertiary education	0.111	0.031	0.032	0.186	177071
Share Non-profit	0.021	0.013	0.000	0.301	175336

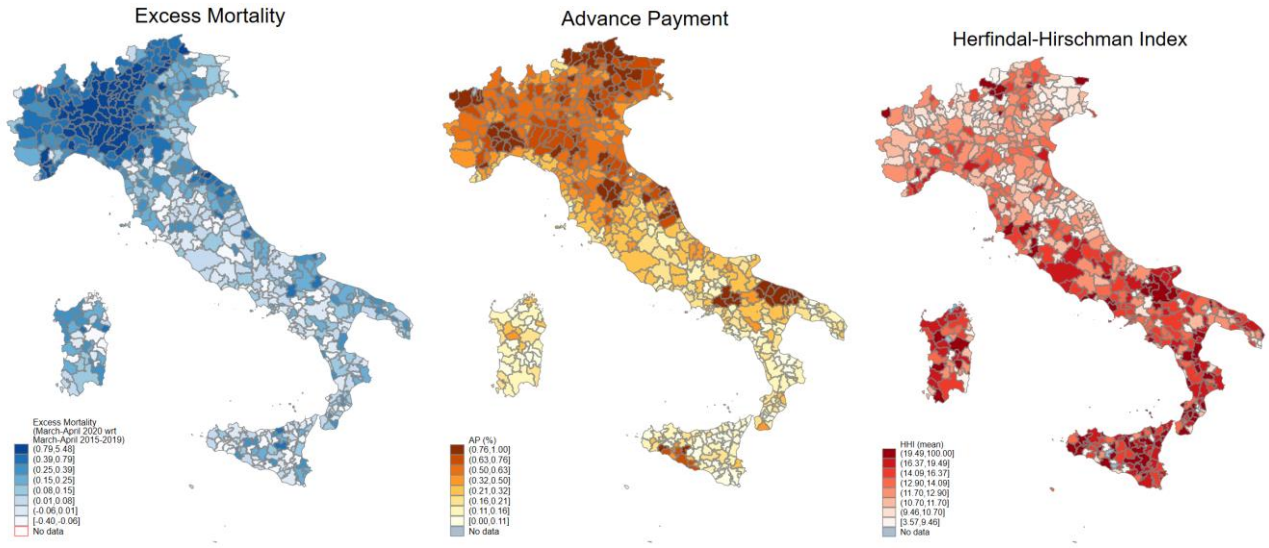
HHI dataset: firms with more than 10 employees

	Mean	Std. Dev.	Min	Max	Obs
HHI	12.638	15.388	0.000	100.000	63137
Intensity	0.342	0.188	0.000	0.950	63137
Excess mortality (municipality)	0.675	1.066	-1.000	11.500	63135
Excess mortality (LMA)	0.636	0.870	-0.396	5.484	63137
Excess mortality 70+ (municipality)	0.744	1.183	-1.000	24.000	63137
Excess mortality 70+ (LMA)	0.691	0.921	-0.458	5.808	63137
Seniority	7.099	5.495	0.000	33.091	63137
Share blue collars	0.694	0.221	0.000	1.000	63137
Share white collars	0.227	0.187	0.000	1.000	63137
Share temporary contract	0.182	0.205	0.000	1.000	63137
Share part time	0.128	0.186	0.000	1.000	63137
Number of contracts	49.587	209.432	11.000	38229.000	63137
Teleworkability	48.498	6.475	34.277	70.448	63137
Liquidity (thousands)	1.362	9.576	0.000	676.977	54025
Labour productivity (thousands)	0.053	0.199	-2.207	33.523	54025
Activity rate - 2019 (%)	51.710	5.536	30.525	63.912	63137
Unemployment rate - 2019 (%)	8.867	5.278	1.194	36.187	63137
Population density	0.653	0.735	0.009	3.099	63137
Share of population with tertiary education	0.109	0.030	0.032	0.186	63137
Share Non-profit	0.020	0.012	0.000	0.307	62420

Figure 1 displays maps of the three main variables of interest in the paper: Excess mortality (*EM*), the share of STW direct payment at the LMA level and STW concentration (HHI). The left map illustrates that *EM* is concentrated in the North of Italy, particularly in Lombardy, Piedmont, Veneto, and other Northern regions, while the impact is lower in the Center and even more in the South. The central map shows that the average probability of Advance Payment for STW is higher in the North of the country, although some southern areas, such as Sicily and the north of Apulia region, also exhibit high levels of Advance Payment. On the other hand, the right map indicates that STW concentration is, on average, lower in the North of Italy. The observed patterns align well with our initial expectations, indicating that higher Excess Mortality is associated with increased STW advance

payment and lower STW concentration. However, it's crucial to note that these are merely descriptive findings, and the correlations could be influenced by various factors, such as heterogeneity in firm observable characteristics, potential spurious relations, and regional variations in the effective use of SWT. To draw more meaningful conclusions, in what follows we employ an econometric approach allowing to properly control for confounding variables.

Figure 1. Maps at the LMA for Excess Mortality (left), Advance Payment, HHI



3. Empirical specification

To investigate the impact of the pandemic on firms' altruistic attitudes and inequality aversion, we utilize the geographical variation at the LMAs level in virus prevalence by estimating the following model:

[1] $$Y_{ij} = \beta_0 + \beta_1 EM_j + \beta_2 g_{ij}(STWIntensity) + \beta_3 X_{ij} + \rho_s * \sigma_r + \epsilon_{ij}$$

where Y_{ij} refers either to our binary indicator of altruism, *Advance Payment*$_{ij}$ or to the STW Herfindal Hirshmann concentration index (HH_{ij}). The independent variable of our main interest is excess mortality (EM_j,) which measures the exposure to different levels of severity of COVID-19, proxied by the excess mortality at the LMA level (or municipality level in a robustness check). To account for the possible influence of the severity of the pandemic on the use of Short-Time Work (STW) at the firm level, we include a flexible non-parametric control variable, g_{ij}*(STWintensity)*, which captures the incidence of STW at the firm level using ventile dummies (linear and quadratic specifications are also tested in robustness checks). Furthermore, we add a vector of control variables, X_{ij}, which includes predetermined observable firm-level characteristics computed in 2019. These characteristics encompass the number of workers employed in the firm (proxied by the number of labor contracts), the share of blue-collar workers, the share of temporary contracts, the share of part-time contracts, the average seniority of workers, and job teleworkability. In all specifications we add the interactions of industry fixed effects and regional fixed effects. Industry fixed effects, ρ_s, at two digits level (36 categories), allow us to take into account

both the fact that some industries have been forced to shut down during the first wave of the pandemic and that industries might have reacted differently to the COVID-19 crisis in relation to the peculiarities of their production system. Regional fixed effects ($\sigma_{r,}$) allow controlling for possible time invariant unobservable variables that might affect both our outcome variables and the local severity of the pandemic, such as the governance of the health system that in Italy is at the regional level.

Our identifying assumption is hence that within the industry-region dimensions (i.e. including interactions of industry and region fixed effects) and controlling for the effective use of SWT (intensity), the spatial distribution of EM_j is exogenous to unobservable factors that might affect the outcome variables of our interest. To support this assumption, we have ascertained that firms did not differ in their predetermined characteristics with respect to the degree of virus exposure. In Table 2 we regress a number of pre-determined characteristics on our treatment variable EM_j (controlling for regional, industry and STW intensity fixed effects). In panel A we consider the advance payment sample, while in panel B the sample of STW concentration. Results show that, in all columns – considering, respectively, Firm size, Share of blue collar, Share of temporary workers, Share of part-time workers, Workers average seniority, Tele-workability – we fail to reject the null hypothesis that there are no significant differences in relation to EM_j. We have also run a regression in which we consider as dependent variable EM_j and as regressors the whole set of predetermined characteristics. We find that regressors are not statistically significant (results not reported and available upon request) confirming again that pre-determined firms' characteristics are not related to the severity of the pandemic.

Table 2. Balance Checks for control variables with respect to EM. Regional fixed effects estimates

Panel A. Advance payment Sample						
	(1) Firm size	(2) Share blue collars	(3) Share temporary	(4) Share part time	(5) Seniority	(6) Teleworkability
Excess mortality (LMA)	0.298	0.004	-0.002	0.002	-0.076	-0.019
	(0.413)	(0.005)	(0.002)	(0.002)	(0.076)	(0.026)
Observations	177071	177071	177071	177071	177071	177071
R2	0.106	0.130	0.075	0.210	0.166	0.795
Intensity ventiles	Yes	Yes	Yes	Yes	Yes	Yes
Regional#Ateco FE	Yes	Yes	Yes	Yes	Yes	Yes
Y mean	20.447	0.734	0.177	0.192	6.080	45.674
X sd	0.799	0.799	0.799	0.799	0.799	0.799
Panel B. HHI Sample						
	(1) Firm size	(2) Share blue collars	(3) Share temporary	(4) Share part time	(5) Seniority	(6) Teleworkability
Excess mortality (LMA)	1.732	0.008	-0.002	0.000	-0.137	-0.015
	(1.163)	(0.005)	(0.003)	(0.001)	(0.100)	(0.037)
Observations	63137	63137	63137	63137	63137	63137
R2	0.030	0.232	0.242	0.253	0.234	0.803
Intensity ventiles	Yes	Yes	Yes	Yes	Yes	Yes
Regional#Ateco FE	Yes	Yes	Yes	Yes	Yes	Yes
Y mean	49.587	0.694	0.182	0.128	7.099	48.498
X sd	0.870	0.870	0.870	0.870	0.870	0.870

Notes: The dependent variable is reported on the top of each column. Standard errors (corrected for heteroskedasticity) are reported in parentheses. The symbol *** indicates that the coefficients are statistically significant at the 1 percent level.

As we will discuss in greater detail in Section 5, while our covariates appear balanced after accounting for industry, region, and SWT intensity fixed effects, concerns about unobservable factors may still arise, potentially raising doubts about our identification strategy. To address them and evaluate the stability of the estimated coefficients even in the presence of unobservables and omitted variable bias, we employ Oster's (2019) methodology.

Finally, we have also conducted a placebo analysis to address potential criticism that the relationship between EM_j and $Advance\ Payment_{ij}/HHI_{ij}$ might be driven by structural factors, leading to the possibility that in areas with higher EM_j firms are more inclined to advance income support payments and exhibit lower STW concentration for reasons unrelated to the pandemic's severity. To deal with this issue, we utilized data from 2019 to compute the dependent variables ($Advance\ Payment_{ij}$ and HHI_{ij}) in the same way as we did for the 2020 analysis. The number of observations in 2019 was lower due to the moderate use of STW during that year. We measured excess mortality ($EM2019_j$) by comparing the number of deaths in 2019 to the average number of deaths recorded during the period 2015-2018. The results of this placebo analysis, presented in Table A1 in the online Appendix of the paper, indicate that, in all specifications, EM_j displays a non-statistically significant coefficient, i.e. EM_j in 2019 did not exhibit different behavior in managing STW during that year. In other words, during "normal" times, firms do not respond to an increase in the number of deaths recorded in the geographical area where their business is located. Likewise, the results of an additional placebo test, which considered the EM_j used in the main analysis (number of deaths in 2020 compared to the average recorded in the period 2016-2019), also show no statistically significant effects on the outcome variables of interest in 2019.

4. Main results

In Table 3 we estimate several specifications of a Linear Probability Model for the probability that the firm decides to advance the payment of the income support to its workers in relation to the severity of the pandemic. In all the regressions, we control for interactions between industry fixed effects (36 categories) and regional fixed effects (20 categories). Standard errors clustered at LMA level are reported in parentheses, i.e. the same level of our treatment variable (EM).

In column (1) we only include among regressors our main variable interest, EM_j. We find that a standard deviation increase in EM_j entails a 2 p. p. increase in the probability to advance the income support by the firm, derived multiplying the *EM* standard deviation, i.e. 0.8, by the coefficient 2.5. This represents a non-negligible impact since the baseline probability to pay directly the STW is equal to 40%, and hence we derive a 5% impact. In column (2) we control for STW Intensity, including dummies for each ventile (not reported). The effect of the pandemic severity becomes slightly smaller: a standard deviation increase in EM_j is associated to a 1.7 p.p. increase in the probability of advance payment. Very similar results are also obtained when we control for our vector of firm characteristics (column 3) and when we also add LMA characteristics (column 4).[21]

[21] The only statistically significant correlations concern the Share of population with tertiary education and the Activity rate. The first variable is negatively correlated with Advance Payment, which might derive from the fact that LMA with a higher presence of educated workers are more productive, and then firms are less afraid of their workers' being financially constrained. It could also be that in these LMA arrangements involving working from home during the pandemic were more frequent making firms less willing to compensate their workers for the risk of contagion faced continuing to perform their job (we will discuss this later in greater detail). The positive association between the activity rate and the probability of advance payment could be explained by the fact that higher activity rates might imply higher worker commuting, which could increase the risk of contagion in the workplace. In response to this increased risk, firms may be more inclined to pay in advance to compensate workers for the potential health risks associated with their daily commutes (Di Porto, Naticchioni, Scrutinio, 2022).

As regards our control variables we find that firms are more inclined to advance the payment of income support to their workers when the proportion of temporary and part-time contracts is lower, and when their workers have longer job seniority. This suggests that firms feel a stronger commitment to their workers when employment relationships are more stable and long-term.[22] Teleworkability attracts a positive coefficient, suggesting that firms with better performance during the pandemic, likely due to their ability to adapt through teleworking, were more proactive in supporting their employees.

Table 3. The Impact of the COVID-19 severity on firm altruism (probability of advance payment)

	(1)	(2)	(3)	(4)
Excess mortality (LMA)	0.025***	0.021***	0.022***	0.019***
	(0.007)	(0.007)	(0.007)	(0.006)
Firm size			0.000	0.000
			(0.000)	(0.000)
Share blue collars			-0.100***	-0.103***
			(0.006)	(0.006)
Share temporary contract			-0.057***	-0.054***
			(0.008)	(0.008)
Share part time			-0.022***	-0.021***
			(0.006)	(0.006)
Seniority			0.008***	0.008***
			(0.000)	(0.000)
Teleworkability			0.005***	0.005***
			(0.000)	(0.000)
Constant	0.421***	0.423***	0.243***	-0.160
	(0.007)	(0.007)	(0.022)	(0.100)
Observations	177071	177071	177071	175336
R2	0.219	0.250	0.264	0.264
Intensity ventiles	No	Yes	Yes	Yes
Regional#Ateco FE	Yes	Yes	Yes	Yes
LMA characteristics	No	No	No	Yes
Y mean	0.434	0.434	0.434	0.430
X sd	0.799	0.799	0.799	0.802

Notes: OLS estimates. The dependent variable is *Advance Income Support*. Standard errors (corrected for heteroskedasticity) and clustered at LMA level are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

In Table 4 we replicate the same specifications reported in Table 3 but considering HHI_{ij} as the outcome variable. The impact of EM_j is negative, ranging from -0.405 to -0.201, and highly statistically significant across all specifications. For instance, in column (1) where no controls are included, we find that a standard deviation increase in EM_j entails a 3% decrease in HHI, computed with respect to the HHI mean. The effect reduces in magnitude when (column 2) we control for the incidence of STW use (including dummies for each ventile of the STW Intensity distribution). This is not surprising, as firms that use STW more intensively are also more likely to involve a larger share of their workforce in the scheme. A very similar coefficient is found also when we add controls for firm characteristics (column 4) and for LMA features (column 5), suggesting that the negative impact of *EMj* on HHI is robust to these additional controls.

[22] We will deepen this issue further in Section 6.

These results hold true for both outcomes also when we do not control for STW Intensity (Table A2 in the online Appendix) or when, instead of controlling for ventiles of the STW incidence, we include a linear or quadratic polynomial of STW Intensity (Table A3).

Table 4. The Impact of the COVID-19 severity on firm inequality aversion (HHI)

	(1)	(2)	(3)	(4)
Excess mortality (LMA)	-0.405**	-0.377***	-0.312***	-0.201*
	(0.170)	(0.131)	(0.117)	(0.115)
Number of contracts			-0.008*	-0.007*
			(0.004)	(0.004)
Share blue collars			-0.810**	-0.917***
			(0.338)	(0.349)
Share temporary contract			14.521***	14.545***
			(0.524)	(0.526)
Share part time			9.855***	9.441***
			(0.400)	(0.393)
Seniority			-0.237***	-0.234***
			(0.016)	(0.016)
Teleworkability			-0.112***	-0.116***
			(0.017)	(0.017)
Constant	12.887***	12.869***	16.976***	17.398***
	(0.172)	(0.144)	(0.886)	(2.336)
Observations	63175	63175	63175	62458
R2	0.059	0.173	0.246	0.247
Intensity ventiles	No	Yes	Yes	Yes
Regional#Ateco FE	Yes	Yes	Yes	Yes
LMA characteristics	No	No	No	Yes
Y mean	12.629	12.629	12.629	12.631
X sd	0.870	0.870	0.870	0.874

Notes: OLS estimates. The dependent variable is *HHI*. Standard errors (corrected for heteroskedasticity) and clustered at LMA level are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

As regards the impact of workforce characteristics we find results that are in line with those found in Table 3. Firms are more likely to equally distribute the burden of STW hours among workers when the share of temporary and part-time contracts is smaller and when average working seniority is longer. LMA features do not generally appear to be correlated with the outcome variable.

As the COVID-19 outbreak has been very heterogenous in Italy (with quite relevant regional differences in the virus's diffusion), in Table A4 of the online Appendix we also carry out our analysis distinguishing between the North and the Center-South regions. As shown in the first two columns of the table, EM_j produces a positive impact on the probability of Advance Payment by firms located both in the North and in the Center-south regions. Nonetheless, the impact is slightly larger in magnitude for firms operating in the northern part of the country: a standard deviation increase in EM_j is associated with a 1.8 p.p. (0.976*0.019) increase in the probability of advance payment by firm located in the North, while in the South the effect is equal to 1.3 p.p. (0.334*0.04). As regards the impact of the pandemic on the STW concentration (HHi_{ij}), we find a negative and statistically significant impact for firms located in the North, with a magnitude that is larger compared to the one found on the whole sample (about 0.36 p.p. – 0.358*1.013), while no effect is detected for firms operating in the Center-South

(see columns 3 and 4 of Table A4).

These results taken together suggest that firms' altruistic attitudes are more malleable than firms' attitudes toward equity. In fact, while our proxy of altruistic behavior reacts to EM_j also in areas that experienced only a moderate impact of the pandemic, the choice to distribute STW hours more equally among workers has been affected by the EM_j mortality only in those regions where during the first wave, from March to June, the number of active cases and the mortality rate were very high.

5. Robustness Checks

In this section we carry out several robustness checks for our findings. First of all, one might argue that the possibility to have a lower STW concentration and, even more, to pay directly the STW, might depend on firm economic conditions. To take this issue into account we merge our sample with Cerved balance sheet data, in such a way restricting the sample to the universe of limited liability companies, and we consider two variables that can be of interest: labour productivity, to control for heterogeneity in terms of performance, and overall liquidity, that might play a crucial role mainly for the outcome direct payment the STW. In Table 5 we add these two variables to the vector of controls. Results are not qualitatively affected and still widely statistically significant: the coefficient attracted by EM_j is unaffected when we consider direct payment as outcome variable (columns (1) and (2)) and becomes slightly smaller in magnitude and not statistically significant when we focus on HHI (columns (3) and (4)).

Table 5. The Impact of the COVID-19 severity on firm altruism and inequality aversion controlling for financial constraints and productivity

	Advance Payment		HHI	
	(1)	(2)	(3)	(4)
Excess mortality (LMA)	0.022***	0.019***	-0.170	-0.048
	(0.006)	(0.005)	(0.112)	(0.109)
Observations	113922	113141	54059	53573
R2	0.278	0.278	0.253	0.254
Intensity ventiles	Yes	Yes	Yes	Yes
Regional#Ateco FE	Yes	Yes	Yes	Yes
Firm and LMA characteristics	Yes	Yes	Yes	Yes
Y mean	0.502	0.500	11.778	11.782
X sd	0.837	0.839	0.882	0.885

Notes: OLS estimates. Standard errors (corrected for heteroskedasticity) and clustered at LMA level are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

As an additional robustness check we have used an alternative measure of COVID-19 severity. As the virus produced more critical consequences for elderly people, we have considered the excess mortality in 2020 compared to the previous years for individuals aged 70 or over. Estimation results reported in Table A5 in the online Appendix of the paper confirm our previous findings.

Moreover, instead of considering the EM_j at the LMA level, we run our regressions using the EM_j computed at municipality level (the municipality in which the firm is located, with cluster standard errors at the same level). Results are reported in Table A6 (in the Appendix of the paper). Again, we find an increase in the excess mortality registered in the municipality where the firm is located produces a positive impact on our measure of altruistic behavior and a negative effect on our proxy of STW concentration. Results are similar in magnitude to those

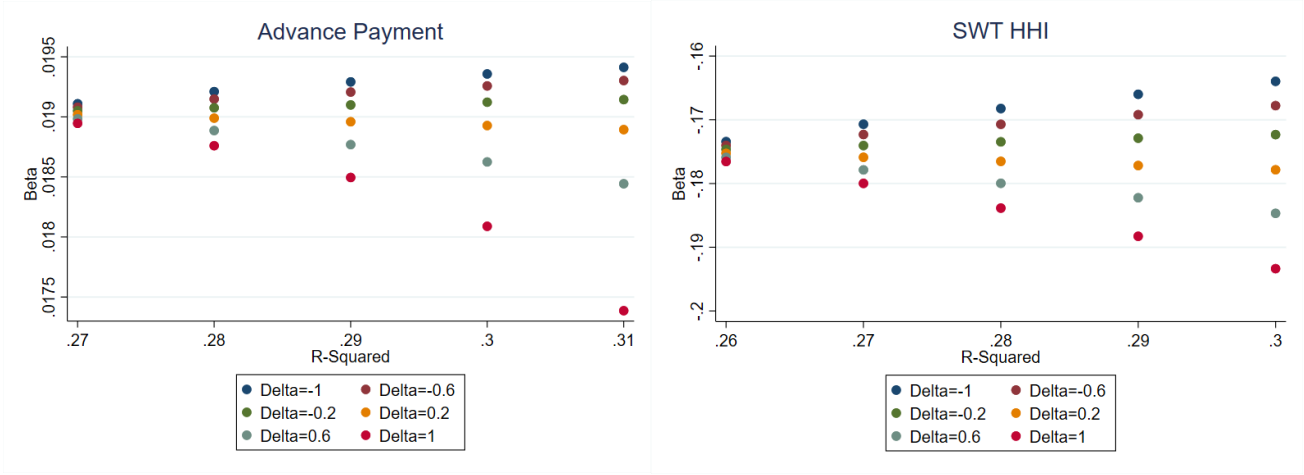
reported in Tables 4 and 5.[23]

Finally, we implement the methodology proposed by Oster (2019) and perform a regression sensitivity analysis. This methodology relies on two main parameters. The first one, denoted by δ, is commonly interpreted as the ratio of the magnitude of selection on unobservables to the magnitude of selection on observables. Assuming δ equal to 1 means that the proportional selection is positive, that is, that the covariance between X and the observables has the same sign and magnitude as the correlation between X and the unobservables. On the contrary, a negative δ stands for a negative proportional selection. Oster (2019) argues that δ cannot be greater than 1 (in absolute value). In other words, the influence of unobservables should not be stronger than that of the observable covariates. Additionally, he suggests that a reasonable upper bound for the increase in the R-square due to unobservables is 25%. In our analysis, we cover a broad set of possible scenarios, allowing δ to vary between -1 and 1 (-1, -0.6, -0.2, 0.2, 0.6, 1) and the R-square to increase by up to 25%. In Figure 2, we present stability coefficients' results for the two outcomes of interest (estimates reported in Tables 3 and 4): the advance payment (left) and the HHI (right). It clearly emerges that even in the worst-case scenarios, where δ is set to -1 or 1, and with the maximum increase in the R-square, the impact of EM remains very stable, i.e. variations of coefficients are negligible. This provides additional confidence in the validity of our identification strategy and the robustness of our findings.

The Oster (2019) methodology also allows us to compute the value of δ at which the point estimates of beta go to zero. In the case of the advance payment outcome, this occurs with a value of δ equal to 10.9 when the R-square is 0.27, and a value of 1.9 when the R-square is equal to 0.31. These values are significantly higher than the threshold proposed by Oster (2019), indicating that the influence of unobservable factors would need to be unrealistically large to nullify the observed effects. Similarly, for the HHI outcome, the value of δ has to be greater than 50.3 for an R-square of 0.26, and a value of 4 for an R-square of 0.32, for instance. Again, these values are much higher than those observed in the actual analysis.

[23] Coefficients appear smaller, but since the standard deviation of EM at municipal level is larger it comes out that effects are rather similar to those reported in Table 3.

Figure 2: Oster (2019) methodology for Advance Payment (left) and HHI (right)



6. Mechanisms: Does parochial altruism matter?

In this section, we aim to delve into the mechanisms that might explain our results. According to psychological theory, individuals tend to respond to existential threats by displaying more altruistic behaviors and engaging in pro-social activities (Cassar et al., 2017; Choi and Bowles, 2007). These altruistic actions are often directed towards individuals perceived as part of the same group as the individual, with whom they share a sense of communal culture and identity. This parochial dimension of altruism may have evolved in ancient societies to enhance the group's cohesion and success in competing with other groups.[24] On the other hand, it is worth noting that the unprecedented global threat posed by the COVID-19 pandemic has been perceived as a threat to humanity as a whole, transcending traditional group boundaries. As a result, individuals and organizations may have exhibited more pro-social behaviors towards both in-group and out-group members.

In our context, it is challenging to directly distinguish between in-group and out-group altruism since while we observe firm pro-social behavior toward its employees, we do not have information on such type of behavior toward other less or more connected groups. Nevertheless, it is reasonable to assume that in situations where the relationship between a firm (entrepreneur or manager) and its workers is long-term and characterized by frequent and direct interactions, the emergence of a group identity is more likely. To explore whether firms' responses to the pandemic, in terms of higher generosity and stronger preferences for equity, were influenced by closer relationships with their employees, we investigated variations in workers' seniority and firm size. By analyzing how firm behavior correlates with these characteristics, we can gain insights into whether firms with more established and interconnected relationships with their workers displayed different responses to the challenges posed by the pandemic.

At this aim we have built two dummy variables respectively for firms with workers who have a *Short average seniority* (first tercile of the average working seniority distribution) and for firms with workers who have a *Long average seniority* (third tercile of the average working seniority distribution), leaving as reference category those

[24] The terror management theory also argues that events that make mortality more salient induce individuals to feel more attached to their ingroup because this reduces existential anxiety.

with workers with a medium average seniority.[25] Then, we have interacted these two dummy variables with our measure of excess mortality. In Table 6 we report specifications (3) and (4) of Tables 4 and 5, adding among regressors *Short average seniority, Long average seniority* and the interaction terms *Short average seniority*EMj* and *Long average seniority*EM$_j$.* As shown in columns (1) and (2) of the Table, we find that the impact of *EM$_j$* on the probability that the firm advances the payment of the economic support to its employees is higher in those environments characterized by a long average worker seniority compared to those with a medium seniority: the interaction term *Long average seniority*EM$_j$* attracts a positive and statistically significant coefficient. Consistently, firms employing workers who have a *Short working seniority* are less likely to advance the payment of the economic support compared to the reference category.

The results regarding our measure of STW concentration as the outcome variable are not as straightforward as those for advance payment. We observe that firms with both high and low average working seniority tend to favor a less concentrated allocation of STW compared to the reference category (Table 6, column 4). In addition, the interaction term *Long average seniority*EM$_j$* attracts a negative and statistically significant coefficient (column 4 Table 6).

However, it is crucial to highlight a key distinction between the outcomes of advance payment and STW concentration. In the case of advance payment, the firm's decision affects all workers uniformly, leaving no room for selectively choosing certain workers over others. Therefore, firms with workers having an above-average seniority are expected to be more inclined to advance the payment of income support. On the other hand, when determining the degree of STW concentration, the firm has the flexibility to choose which workers will be included in the scheme. Consequently, a firm with a high average seniority (comprising workers with both very long and short seniority) might decide to increase concentration by selecting only workers with short seniority, while leaving those with long seniority unaffected. The firm ability to selectively include workers in the scheme allows for more diverse decisions, which can lead to less clear-cut results. Then, we believe that this outcome might not be well-suited for the analysis of parochial altruism, and therefore, we focus our attention on advance payment.

[25] In an employee-level analysis, we examined the number of working hours spent in short-time work (STW) as a percentage of the total hours the employee was supposed to work (see Rapporto annuale INPS 2021). Controlling for firm and worker characteristics, we found a negative and non-linear relationship between seniority and STW intensity. Specifically, an increase of one year of seniority reduces STW by about one percentage point. However, when seniority reaches 12 years, additional years do not produce any further impact on STW intensity. These results hold even when firm fixed effects are included, indicating that they are not due to unobservable differences between firms. This evidence supports the idea that personal relationships may have influenced entrepreneurs' decision-making during the pandemic.

Table 6. The impact of the COVID-19 severity on firm altruism and inequality aversion. Heterogeneity according to workers' seniority

	Advance Payment		HHI	
	(1)	(2)	(3)	(4)
Excess mortality (LMA)	0.023***	0.021***	-0.116	-0.054
	(0.007)	(0.006)	(0.106)	(0.107)
Excess mortality (LMA)#Seniority 1° tercile	-0.022***	-0.022***	-0.206*	-0.202*
	(0.005)	(0.005)	(0.112)	(0.112)
Excess mortality (LMA)#Seniority 3° tercile	0.007*	0.007*	-0.152	-0.157*
	(0.004)	(0.004)	(0.093)	(0.094)
Seniority 1° tercile	-0.029***	-0.027***	2.623***	2.600***
	(0.004)	(0.004)	(0.134)	(0.135)
Seniority 3° tercile	0.068***	0.068***	-0.489***	-0.486***
	(0.004)	(0.004)	(0.104)	(0.104)
Observations	177071	175336	62113	61407
R2	0.264	0.264	0.249	0.249
Intensity ventiles	Yes	Yes	Yes	Yes
Regional#Ateco FE	Yes	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes	Yes
LMA haracteristics	No	Yes	No	Yes
Y mean	0.434	0.430	11.136	11.136
X sd	0.799	0.802	0.872	0.876

Notes: OLS estimates. Standard errors (corrected for heteroskedasticity) and clustered at LMA level are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

Another strategy to evaluate the parochial altruism is to consider firms of different sizes. In small firms it is more likely to have personal interactions between the entrepreneur and his/her employees, which might make group identity more salient. Therefore, we split our sample and separately consider firms with less than 15 employees and firms with 15 or more employees. As in the analysis considering as outcome variable the HHI small firms were excluded, we run this investigation focusing exclusively on the probability that firms advance the income support payment. As shown in Table 7, we find that the effect of *EM* on the probability of advance payment is positive and statistically significant both for small and large firms. However, the effect is much larger in magnitude for the small firms: a standard deviation increase in EM produces a 5% increase for small firms and only a 2% increase for large firms). This finding suggests that the intensity of ties between entrepreneurs and workers plays a role consistent with a parochial altruism explanation: the personal interactions and closer relationships in small firms might enhance the sense of communal identity and strengthen the willingness to support employees during times of crisis like the COVID-19 pandemic.

To gain further insights into the driving forces behind our results, we explored whether firms' response to the pandemic in terms of increased generosity and stronger preference for equity could be attributed to a sense of gratitude towards workers who continued to work on-site, facing higher risks of contagion, while many others stayed protected at home due to lockdown measures. If this motivation was at play, we would expect the impact of *EM* to be stronger for firms that did not reduce their production significantly and, therefore, did not heavily utilize STW hours. Workers employed in these firms would likely face higher risks of contagion compared to individuals who could stay in a more protected environment. While we acknowledge that firms with lower STW utilization might be more inclined toward altruism also due to a lower burden of STW, our results revealed a

different pattern. To investigate the assumption of firms' gratitude toward workers continuing to work, we divided the sample based on the median value of the STW Intensity. Findings are presented in Table A7 of the online Appendix. We observed that a unit increase in *EM* led to an increase in the probability of advance payment for firms with low STW intensity by 1.5 to 1.9 percentage points (columns 1 and 2), while the impact ranged from 2.6 to 2.7 percentage points for firms with high STW use (columns 4 and 5). These results suggest that the increase in firm altruism towards its employees is not driven by a desire to compensate workers for higher health risks related to commuting to the workplace and interacting with colleagues. Instead, our findings point towards a more general pattern of firms responding to the pandemic with increased generosity and equity preferences towards their employees.

Table 7. The impact of the COVID-19 severity on firm altruism. Heterogeneity according to firm size

	Small firms (<=15 employees)		Large firms (>15 employees)	
	(1)	(2)	(3)	(4)
Excess mortality (LMA)	0.026***	0.024***	0.017***	0.015***
	(0.008)	(0.007)	(0.006)	(0.005)
Observations	132263	131059	44764	44233
R2	0.204	0.203	0.331	0.333
Intensity ventiles	Yes	Yes	Yes	Yes
Regional#Ateco FE	Yes	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes	Yes
LMA characteristics	No	Yes	No	Yes
Y mean	0.369	0.366	0.623	0.621
X sd	0.759	0.762	0.892	0.897
Observations	132263	131059	44764	44233

Notes: OLS estimates. Standard errors (corrected for heteroskedasticity) and clustered at LMA level are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

7. Concluding remarks

The COVID-19 pandemic has presented an unprecedented, unexpected, and global threat to humanity, and its effects continue to be a subject of extensive research across various disciplines. Understanding how individual behavior changes in such extreme circumstances is a critical area of investigation. In this paper, we contribute to the literature by shifting the focus towards firm choices, which have been relatively overlooked compared to individual choices. Specifically, we explore how the local severity of COVID-19, as measured by excess mortality compared to previous years, influences firms' altruism and preferences towards inequality in managing a short-time work scheme (STW) – a policy tool widely used by the Italian government during the initial months of the pandemic. By investigating how local severity of COVID-19 impacts firms' decision-making processes, the study sheds light on the role of businesses in responding to unprecedented challenges.

Leveraging a unique dataset of administrative data provided by INPS on the universe of Italian manufacturing firms, we investigate two outcome variables: the decision to advance the payment of income support to workers, serving as a proxy for firm altruism, and the allocation of working hours reduction among the workforce, serving as a proxy for inequality preferences.

Our findings reveal that the pandemic has led to an increase in the pro-social preferences of Italian entrepreneurs.

A standard deviation increase in excess mortality positively impacts the advance payment of SWT by 4-5%, depending on the specification. The positive association between excess mortality and the probability of advance payment indicates a greater sense of social responsibility among firms during this challenging period. Moreover, the pandemic has had a negative and statistically significant impact on inequality preferences. Specifically, a standard deviation increase in excess mortality is associated with a reduction in the degree of STW concentration by approximately 1.5%. This indicates that firms were more inclined to distribute the reduction of working hours more evenly among their workforce during the pandemic, showing a heightened concern for equity and fairness. These results are robust to the inclusion of a broad set of firm characteristics, including financial conditions and productivity, and to alternative definitions of the pandemic severity and of local areas. We also employ the methodology by Oster (2019) to address the coefficient stability issue with respect to the possible role of unobservables, and results are highly reassuring.

The study also highlights that the impact of the pandemic on firm altruism is more substantial for firms with more intense ties between entrepreneurs and workers, as measured by worker seniority and firm size. This outcome aligns with the concept of parochial pro-social behavior, as the heightened altruism and support shown by these firms were likely motivated by a sense of collective identity and shared fate among the members of the organization.

The study's findings have the potential to yield significant policy implications. Understanding how firms respond during crises and their preferences towards altruism and inequality can inform policymakers about the effectiveness of support measures and the dynamics of economic recovery. Additionally, the findings highlight the importance of fostering strong working relationships between entrepreneurs and workers to promote pro-social behaviors within firms.

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Appendix

Table A1. Placebo Tests. The Impact of EM_j and $EM2019_{ij}$ on firm altruistic and equity attitudes in managing the 2019 STW

	Advance Payment		HHI	
	(1)	(2)	(3)	(4)
Excess mortality 2019 (LMA)	0.006		-0.077	
	(0.007)		(2.666)	
Excess mortality (LMA)		0.000		-0.572
		(0.001)		(0.375)
Observations	21613	21613	6475	6475
R2	0.119	0.119	0.174	0.175
Intensity ventiles	Yes	Yes	Yes	Yes
Regional#Ateco FE	Yes	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes	Yes
Y mean	0.990	0.990	15.888	15.888
X sd	0.094	0.729	0.088	0.790

Notes: OLS estimates. Standard errors (corrected for heteroskedasticity) and clustered at LMA level are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

Table A2. The Impact of the COVID-19 severity on the probability of advance payment by the firm and on STWHHI without controlling for STW Intensity

	Advance Payment		HHI	
	(1)	(2)	(3)	(4)
Excess mortality (LMA)	0.025***	0.022***	-0.334**	-0.259*
	(0.007)	(0.006)	(0.153)	(0.140)
Observations	177071	175336	63175	62458
R2	0.241	0.241	0.115	0.115
Regional#Ateco FE	Yes	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes	Yes
LMA characteristics	No	Yes	No	Yes
Y mean	0.434	0.430	12.629	12.631
X sd	0.799	0.802	0.870	0.874

Notes: OLS estimates. Standard errors (corrected for heteroskedasticity) and clustered at LMA level are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

Table A3. The Impact of the COVID-19 on firm altruism and inequality aversion controlling for a first and a second polynomial of STW intensity

	Advance Payment		HHI	
	(1)	(2)	(3)	(4)
Excess mortality (LMA)	0.021***	0.020***	-0.214*	-0.207*
	(0.006)	(0.006)	(0.127)	(0.109)
Intensity	-0.124***	-0.539***	-20.405***	-87.000***
	(0.010)	(0.035)	(0.640)	(1.974)
Intensity^2		0.485***		87.363***
		(0.034)		(2.541)
Observations	175336	175336	62458	62458
R2	0.245	0.248	0.162	0.218
Regional#Ateco FE	Yes	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes	Yes
LMA characteristics	No	Yes	No	Yes
Y mean	0.430	0.430	12.631	12.631
X sd	0.802	0.802	0.874	0.188

Notes: OLS estimates. Standard errors (corrected for heteroskedasticity) and clustered at LMA level are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

Table A4. The Impact of the COVID-19 severity on firm altruism and inequality aversion, by macro area

	Advance payment		HHI	
	North	Center-South	North	Center-South
	(1)	(2)	(3)	(4)
Excess mortality (LMA)	0.019***	0.041**	-0.358***	0.039
	(0.007)	(0.018)	(0.123)	(0.337)
Observations	74445	102626	31862	31310
R2	0.153	0.238	0.241	0.256
Intensity ventiles	Yes	Yes	Yes	Yes
Regional#Ateco FE	Yes	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes	Yes
LMA characteristics	Yes	Yes	Yes	Yes
Y mean	0.599	0.313	11.259	14.024
X sd	0.976	0.334	1.013	0.387

Notes: OLS estimates. Standard errors (corrected for heteroskedasticity) and clustered at LMA level are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

Table A5. The Impact of the COVID-19 severity (EM 70+) on firm altruism and inequality aversion

	Advance Payment		HHI	
	(1)	(2)	(3)	(4)
Excess mortality 70+ (LMA)	0.020***	0.018***	-0.311***	-0.207*
	(0.006)	(0.005)	(0.109)	(0.107)
Observations	177071	175336	63175	62458
R2	0.264	0.264	0.246	0.247
Intensity ventiles	Yes	Yes	Yes	Yes
Regional#Ateco FE	Yes	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes	Yes
LMA characteristics	No	Yes	No	Yes
Y mean	0.434	0.430	12.629	12.631
X sd	0.847	0.849	0.921	0.925

Notes: OLS estimates. Standard errors (corrected for heteroskedasticity) and clustered at LMA level are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

Table A6. The Impact of the COVID-19 severity at municipal level on firm altruism and inequality aversion

	Advance Payment		HHI	
	(1)	(2)	(3)	(4)
Excess mortality (municipality)	0.012***	0.011***	-0.209***	-0.154***
	(0.003)	(0.002)	(0.056)	(0.058)
Observations	177055	175320	63173	62456
R2	0.264	0.264	0.246	0.247
Intensity ventiles	Yes	Yes	Yes	Yes
Regional#Ateco FE	Yes	Yes	Yes	Yes
Firm Characteristics	Yes	Yes	Yes	Yes
LMA characteristics	No	Yes	No	Yes
Y mean	0.434	0.430	12.629	12.631
X sd	0.985	0.985	1.066	1.067

Notes: OLS estimates. Standard errors (corrected for heteroskedasticity) and clustered at LMA level are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

Table A7. The impact of the COVID-19 severity on firm altruism. Heterogeneity according to STW intensity

	STW intensity below/equal median		STW intensity above median	
	(1)	(2)	(3)	(4)
Excess mortality (LMA)	0.019***	0.015***	0.027***	0.026***
	(0.006)	(0.005)	(0.009)	(0.008)
Observations	88499	87495	88512	87779
R2	0.273	0.274	0.156	0.153
Intensity ventiles	Yes	Yes	Yes	Yes
Regional#Ateco FE	Yes	Yes	Yes	Yes
Firms characteristics	Yes	Yes	Yes	Yes
LMA characteristics	No	Yes	No	Yes
Y mean	0.563	0.559	0.305	0.301
X sd	0.857	0.861	0.722	0.724

Notes: OLS estimates. Standard errors (corrected for heteroskedasticity) and clustered at LMA level are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.