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IZA DP No. 13629

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ISSN: 2365-9793

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ABSTRACT

The Economic Effects of COVID-19 and Credit Constraints: Evidence from Italian Firms' Expectations and Plans*

We investigate the economic effects of the COVID-19 pandemic and the role played by credit constraints in the transmission mechanism, using a novel survey of expectations and plans of Italian firms, taken just before and after the outbreak. Most firms revise downward their expectations for sales, orders, employment, and investment, while prices are expected to increase at a faster rate, with geographical and sectoral heterogeneity in the size of the effects. Credit constraints amplify the effects on factor demand and sales of the COVID-19 generated shocks. Credit-constrained firms also expect to charge higher prices, relative to unconstrained firms. The search for and availability of liquidity is a key determinant of firms' plans. Finally, both supply and demand shocks play a role in shaping firms' expectations and plans, with supply shocks being slightly more important in the aggregate.

JEL Classification: E2, E3, G30, I10

Keywords: COVID-19, pandemic, firms' expectations, firms' plans, credit constraints, prices, employment, investment, sales, orders

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* We would like to thank Monitoraggio Economia e Territorio for making the survey possible giving us access to the resulting data. Moreover, we would like to thank Rui Albuquerque, Susanto Basu, Ryan Chahrour, Marco Errico, Luca Gemmi, Pietro Grandi, Lisa Lynch, Jaromir Nosal, Massimiliano Stacchini, Philip Strahan, Rosen Valchev, and all the other participants to the Macroeconomics Lunch at Boston College for useful comments and suggestions.

1 Introduction

This paper investigates the economic effects of the COVID-19 outbreak and the role played by financial frictions in the transmission of the associated shocks. We take advantage of a unique survey of Italian firms' expectations and plans taken immediately before and immediately after the pandemic outbreak. This data allows us to adopt an event study approach to analyze how firms' revision in expectations over a two-month window are affected by the COVID-19 pandemic.

Our analysis addresses three main research questions. First, we ask whether credit constraints amplify the shocks associated with the pandemic on firms' expected sales, orders, employment, and investment. Second, we analyze changes in firms pricing strategies and discuss how they are affected by financial frictions. Finally, we discuss the relative importance of supply and demand shocks, as perceived by firms at the beginning of the crisis.

Our empirical investigation exploits survey data on firms' expectations for sales and orders as well as plans for prices, employment, and investment. We collect this information between March 24 and April 7, 2020 – two weeks after the implementation of the first lockdown policies that followed the explosion in the number of cases and deaths. This survey covers firms in the manufacturing and production service sectors and is a special supplement to the pre COVID-19 wave of the Monitoraggio Economia e Territorio (MET) survey completed by mid-January, 2020 –one month before the official Italian "case zero" in Italy.[1] In addition to a wide set of firms' characteristics, the pre COVID-19 MET survey contains expectations on sales and pricing strategies for the next year, together with questions on loan applications that we employ to construct firm-specific proxies of financial constraints. Our matched dataset is composed of 7,800 firms for which we have full pre and post COVID-19 information in a two-month interval around the pandemic outbreak. For approximately 5,000 of them we also have complete balance-sheet information.

[1]The original dataset is fully representative of all size classes (including micro-sized companies), geographic region, and two-digit levels in the manufacturing and production service sectors.

There are several reasons why the Italian experience is relevant and interesting. First, Italy was the first Western country to be severely hit by the pandemic, which was largely unanticipated. It was also the first country in the world to implement a national lockdown policy. Second, there is significant geographical heterogeneity in the severity of the COVID-19 outbreak with some provinces in the North being hit the hardest. In addition, there is sectoral heterogeneity due to the differential government restrictions on production that forced some firms to shut down while other firms deemed essential stayed open throughout the entire pandemic. Third, Italian firms are predominantly small and privately-held, thus a priori more likely to be credit constrained. This feature makes the Italian industrial system a particularly instructive setting to explore the role of financial frictions.

Our empirical strategy is based on the assumption that the revision in firms' expectations between the two surveys is entirely due to the COVID-19 pandemic. This assumption is reasonable because the two surveys are taken within a short time interval and no other significant event occurred during that period. For expected sales and price plans the same questions were asked in both surveys so that we can calculate the revision in expectations over approximately the same 12-month horizon. For other variables such as orders, employment, and investment, we cannot exactly control for the pre COVID-19 expectations, but we use sales anticipation to account for firms' outlook before the pandemic. Our aim is to investigate how post COVID-19 expectations are affected by financing constraints, allowing for heterogeneous geographical and sectoral components of the pandemic shocks and controlling for pre COVID-19 expectations and a wide set of firm's characteristics.

Our analysis delivers a number of important and novel results. At a descriptive level, our survey data suggests that the COVID-19 outbreak induced a significant leftward shift of the distributions for expected sales and a rightward shift for price plans. In absolute values, these changes are larger for firms that are financially constrained, classified as non-essential, or located in provinces more severely hit by the pandemic, as measured by the number of COVID-19 related deaths.

Motivated by this descriptive evidence we investigate econometrically the determinants of firms' expectations and plans in a multivariate framework. Our econometric results show that financial frictions shape the effect of the COVID-19 outbreak on firms' sales and orders expectations and on firms' employment, investment, and price plans. Credit-constrained firms display a relatively more pessimistic outlook for sales and orders, and plan to reduce employment and investment relatively more than unconstrained firms. In other words, our results suggest that financial frictions amplify the effects of the shocks generated by the COVID-19 pandemic. In addition, our evidence supports the view that credit-constrained firms plan to increase prices relatively more (or to decrease prices relatively less) than unconstrained firms. This result is consistent with a markup strategy by financially-constrained firms aimed at boosting internal sources of funds even at the cost of future losses of their customer base.

We also investigate the effect of geographical and sectoral components of the shocks generated by the COVID-19 outbreak and the associated government response. Our evidence shows that firms in areas that were more severely affected by the COVID-19 epidemic display a significantly different reaction in terms of expectations and plans. Such firms are more pessimistic in terms of future sales and orders, plan to decrease investment and employment, and to increase prices by more, relative to firms located in provinces with fewer deaths. In addition, our evidence suggests that firms that were subject to more severe restrictions, because deemed to be non-essential, have more pessimistic sales and order expectations, and plan a larger decrease in both employment and investment.

Finally, we investigate whether the COVID-19 outbreak is affecting the markup of Italian firms also for reasons other than the existence of financing constraints. In the light of theories that emphasize collusive oligopoly considerations or variations in the number of firms, we explore two additional reasons for countercyclical markups: sectoral concentration and sectoral firm dynamics.[2] Sectoral concentration or measures of firms dynamics do not appear to significantly affect firms' pricing strategy on their own.

[2]See Section 5.4 for more details.

Nevertheless, credit-constrained firms located in more concentrated or more dynamic sectors plan to increase prices relatively more than their credit-constrained counterpart located in less concentrated or less dynamic sectors. We conclude that, while there is ample evidence of countercyclical markups due to credit constraints consideration, other reasons for countercyclicality do not play an important role in shaping the effect of the COVID-19 outbreak on prices. As unconstrained firms represent the vast majority (80 percent) of our sample, an increase in prices coupled with a fall in sales, orders, and investment is suggestive of the supply component of the shocks generated by the pandemic being somewhat larger than the demand component.

The structure of the paper is as follows. In Section 2 we discuss the related literature. Section 3 describes the data sources. Section 4 provides some descriptive evidence on the effects of the COVID-19 pandemic on sales and price expectations. Section 5 presents the econometric results, while Section 6 concludes the paper.

2 COVID-19 outbreak: related literature

The COVID-19 outbreak generates complex and multifaceted supply and demand shocks. On the supply side, the lockdown imposed on businesses obviously represents a very large, albeit temporary, adverse labor supply shock. The restrictions imposed by the authorities on labor input mobility are also likely to increase firms' costs or decrease the efficiency of labor if, for instance, teleworking is an imperfect substitute for working on site. Moreover, the increased morbidity and mortality, even independently from lockdown measures and restrictions on mobility, affects labor supply negatively. Although the effect of morbidity and mortality, *per se*, on the labor supply may be small, the fear and concerns generated by contagion and deaths may lead to substantial reduction in labor supply because workers may decide to report sick or take time off due to this fear. On the demand side, the pandemic shock may affect consumption and saving decisions due for instance to an increase in precautionary savings and a fall in consumption as a consequence of the increase in uncertainty. Such increase can also lead to a postponement of investment projects and, therefore, to a fall in investment demand. Moreover, the disruption of supply in one sector can be felt as a demand shock for upstream firms or a negative supply shocks for downstream firms.

Not surprisingly, the economic literature on the COVID-19 outbreak is multifaceted as well, with a rapid increase in the number of papers that analyze the economic consequences of the pandemic from a micro and macro perspective. Some of the micro papers are based on firm- and household-level survey evidence.[3] Other papers rely on different data sources.[4] With regard to the role of financial factors, Acharya and Steffen (2020) show that during the COVID-19 pandemic the US stock market had higher valuations for firms with access to liquidity through cash holdings or credit lines. Ramelli and Wagner (2020) use US stock prices and corporate conference calls to show that initially investors negatively priced internationally-oriented firms. As the virus spread in Western countries, leverage and internal liquidity emerged as more important value drivers. None of the papers above does or can explore fully the effect of the COVID-19 pandemic on expectations or plans for both quantities, factor demand, and prices, accounting also for financial frictions in the transmission mechanism. Moreover, the availability of expectations just before and just after the COVID-19 outbreak allows us to use the shortness of the window to identify the economic effects of the pandemic. Furthermore, we are in a unique position to account for firm-specific measures of financial frictions based on survey information about loan applications.

[3]Bartik et al. (2020) on US small businesses' conditions and decisions, Balleer et al. (2020) on German firms' price plans and the role of demand versus supply shocks, Buchheim et al. (2020) on the effect of country-wide policy actions and local conditions on German firms' outlook and the uncertainty associated with it, Buchheim et al. (2020) on German firms' mitigation strategies, and Baert et al. (2020) on Flemish employees' teleworking. See also Coibion et al. (2020) on US household labor-market experience and Briscese et al. (2020) on Italian household compliance with government mandated restrictions. Brancati and Brancati (2020) provide some evidence on the COVID-19 pandemic for innovative and international-oriented companies on the same dataset.

[4]Bekaert et al. (2020) rely on Survey of Professional Forecaster to disentangle aggregate demand and supply shocks generated by the COVID-19 outbreak. In a similar vein, Brinca et al. (2020) use sign restrictions in a structural VAR to identify the supply and demand component of the COVID-19 related shocks at a sectoral level. Andersen et al. (2020) use customer transactions from a Danish bank to analyze individuals responses. Hassan et al. (2020) develop text-based measures of costs, benefits, and risks for listed firms in a large number of countries. Baker et al. (2020) use news-paper measures of the increase in uncertainty for the US, the UK, and other countries. Finally, Caggiano et al. (2020) use a structural VAR to show how the effects of the COVID-19 induced uncertainty can be amplified by worsening in financial frictions.

Finally, a different set of contributions has enriched standard macro models with features that capture the COVID-19 related shocks.[5] Some of these papers have a multi-sector and/or input-output structure, and allow for nominal wage rigidities and financial constraints (Baqaee and Farhi, 2020b; Faria-e Castro, 2020; Guerrieri et al., 2020; Woodford, 2020). Our empirical contribution also emphasizes the importance of sectoral heterogeneity, due, for instance, to the essential classification of firms, as well as the role of financial constraints in the transmission mechanism. In addition, we document the importance of spatial heterogeneity in the intensity of the COVID-19 related shocks. Moreover, we provide firm-level evidence on the relative importance of demand, cost, and markup shocks and describe the aggregate implications they give rise to. Our results can be compared with those obtained in the calibrated models we have just mentioned. In the aggregate, we document a slight increase in firms' prices, together with a large fall in sales. This result is consistent with the simulations in Baqaee and Farhi (2020b) that allow for sectoral and aggregate shocks. More broadly, our findings are consistent with those obtained in models that generate a large fall in output but a moderate price response (e.g., Eichenbaum et al., 2020a).

More generally, our paper contributes to the overall debate on the role of capital market imperfections in the amplification or mitigation of macroeconomic shocks and on the sensitivity of different types of firms to such shocks. The idea behind amplification is that when a shock occurs, the net worth of the firm (or the bank) is impacted, leading to a change in the wedge between internal and external finance and, hence, in investment and labor decisions. There has been a lively debate in the context of DSGE models on whether amplification occurs or not.[6] From an empirical standpoint, there is firm-level evidence in favor of amplification of demand shocks, such as monetary

[5]See also Baqaee and Farhi (2020a), Basu and Bundick (2020), Bigio et al. (2020), Bodenstein et al. (2020), Eichenbaum et al. (2020a), Eichenbaum et al. (2020b), Fernández-Villaverde and Jones (2020), Fornaro and Wolf (2020), Kaplan et al. (2020), Krueger et al. (2020), and McKibbin and Fernando (2020).

[6]The seminal papers are Bernanke et al. (1999) and Carlstrom and Fuerst (1997). The presence or absence of amplification depends upon the nature of the shock itself, the nature of the financial contract, and the parameterization of the model. See, for instance, Gertler and Karadi (2011), Carlstrom et al. (2016), and Dmitriev and Hoddenbagh (2017).

policy shocks, for firms that are more likely to be financially constrained. Moreover, there is evidence that such firms are more sensitive to shocks to banks' balance sheet and to uncertainty shocks. In this area the challenge is the identification of truly unanticipated exogenous shocks.[7] The COVID-19 event represents an ideal laboratory because it generates shocks that are exogenous and unanticipated, and this allows us to present new evidence on the role of financing constraints in the transmission of non-monetary shocks. Our evidence suggests that financing constraints enhance the effects of the shocks generated by the COVID-19 pandemic on factor demand and output decisions.

Moreover, the availability of price expectations/plans in our data is an opportunity to investigate the effect of financial constraints on firms' pricing strategies. Our findings that financially constrained firms expect to charge higher prices is consistent with previous theoretical and empirical work on the price setting of constrained firms.[8] The basic logic is that in a downturn firms find it optimal to increase prices in order to raise current liquidity, due to greater difficulties to access external finance, instead of investing in building their customer base.

In addition to financing constraints, there can be other explantions for countercyclical markups. In the context of a collusive oligopoly model, for instance, markups may be countercyclical because firms are less able to collude during booms: when demand is high, the benefit from deviating by lowering prices increases and the oligopoly must lower its markup in order to maintain discipline.[9] Moreover, when entry and

[7]The literature that bears directly or indirectly on this issue is too vast to review here. We just mention the seminal contributions by Gertler and Gilchrist (1994) using semi-aggregate data, Kashyap et al. (1994) –although the original aim of the paper was to investigate the bank-lending channel– using firm-level data. For evidence on the effects of shocks to the banking system during the financial crisis or the sovereign debt crisis, on different type of firms see Chodorow-Reich (2014) and Balduzzi et al. (2018) among others. For evidence on the effects of uncertainty shocks in presence of financing constraints see Gilchrist et al. (2014) and Alfaro et al. (2018).

[8]The seminal papers in the area are Gottfries (1991) and Chevalier and Scharfstein (1995). A recent important contribution providing empirical evidence in support of this mechanism is Gilchrist et al. (2017). Kim (2020), instead, provides evidence that firms affected by a negative financial shock decrease prices in the short run in order to liquidate inventories and generate additional cash flow, followed by a price increase in the medium run.

[9]Rotemberg and Saloner (1986), Rotemberg and Woodford (1991), Rotemberg and Woodford (1992), and Rotemberg and Woodford (1993).

exit is possible, changes in demand prociclically affect the number of firms leading to a countercyclical change in the degree of competitiveness in a sector. In periods of low demand, therefore, prices can be set higher relative to marginal cost while the opposite is true in a period of high demand.[10] Our evidence for unconstrained firms does not provide support for countercyclical markup movements due to a collusive oligopoly mechanism or the entry/exit of firms in the aftermath of the COVID-19 outbreak. More specifically, prices are not set to be higher in highly concentrated sectors or in sectors characterized by greater churning or mortality of firms. For credit-constrained companies there is, instead, evidence that sectoral concentration and churning affect firms' ability to set higher prices in order to boost current liquidity.

3 Data sources and description

Our main source of data is a firm-level survey designed to explore the consequences of the COVID-19 outbreak, combined with the 2019 wave of the MET survey on the Italian industrial system.[11] Unlike other surveys, MET provides information on every size class including micro-sized companies with less than ten employees. The survey is representative of the manufacturing sectors (60% of the sample) and the production-service industry (40%), with a total coverage of 38 NACE Rev.2 3 digit sectors.[12] Coherently with the timing of the previous waves, the administration of the 2019-survey ended in mid-January of the following year, right before the outbreak of the COVID-19 pandemic for Italy (the first reported case was on February 1, 2020). This unique characteristic makes the 2019-wave MET survey an essential source of information providing a comprehensive snapshot of firms' conditions just before entering the COVID-19 outbreak.

[10] Chatterjee and Cooper (1989), Chatterjee et al. (1993), and Bilbiie et al. (2012). Bilbiie et al. (2012) also allow for an elasticity of demand that is higher in downturns using Feenstra (2003).

[11] MET, *Monitoraggio Economia e Territorio*, is a private research center surveying a large number of Italian companies on a regular basis. It is one of the most comprehensive survey administrated in a single European country, with an original sample comprising seven waves – 2008, 2009, 2011, 2013, 2015, 2017, and 2019 – and roughly 25,000 observations in the cross section. The survey follows a sampling scheme representative at the firm size, geographic region, and industry levels.

[12] Production services sectors are: distributive trades, transportation and storage services, information and communication services, administrative and support service activities.

The original questionnaire contains a wealth of information on firms' performances and strategies, including data on direct proxies for firms' financial constrains, bank-lending relationships, supply-chain internationalization, and R&D processes. This information is supplemented with that contained in a second survey specifically conceived to study the effect of the COVID-19 pandemic and administrated to the entire sample of respondents of the original questionnaire. This allows one to have information on both the pre and post COVID-19 expectations and plans for each company. To avoid excessive variation in the information set of the respondents, the timing of the survey was restricted in a 2-week window between March 24, and April 7, 2020. The administration started 13 days after the generalized initial lockdown imposed by the Italian government (March 11, then revised in March 22), so as to leave each firm enough time to update its beliefs and plans. This post COVID-19 survey had a final response rate of 33%, which is substantial for such a small time window, with a final number of completed interviews for about 7,800 companies. The distribution of respondents across macro-sectors, geographical macro-regions, and size-classes is similar to the one in the original survey (see Appendix B for details), but endogenous selection of the respondents is possible. We will take care of this issue by employing ex post stratification weights for the COVID-19 survey that are calibrated to reproduce the population aggregates from the sample of respondents. However, in estimation we will experiment both with weighted and unweighted data, and discuss any difference that may arise (see Section 5).

The post COVID-19 survey is composed of three main blocks. The first one replicates the original questions on expected changes in future sales and prices so to have the exact correspondence needed to construct a revision in firms' expectations around the COVID-19 pandemic. A second block of questions asks about firms' expectations and plans following the Coronavirus outbreak on new orders, number of workers employed, expenditure in tangible investments, expenditure in intangible investments over the next 12 months, in addition to sales growth in the following three and 12 months.

These variables are effectively continuous.[13] Finally, a third block of questions directly asks about actual actions of the firms and about the difficulties in accessing credit, following the COVID-19 outbreak.

A critical issue that needs to be discussed is whether firms' expectations actually reflect the dynamic of the underlying variables they refer to. While we cannot say much on the validity of firms' beliefs after the COVID-19 outbreak, we performed a number of validation tests based on past waves of the MET survey. First of all, we exploit the panel dimension of the original dataset (between 2008 and 2019) and regress realized sales growth on the expectations held at the beginning of the period, together with province, sector, and year dummies. We show that firms' expectations are positively and significantly correlated with realized future sales, with a sizable predictive power: the R-square increases from 0.039 to 0.210 when they are included as regressors. Importantly, if we restrict the analysis only to the sovereign debt crisis period firms' expectations gain even more significance and the incremental R-squared reaches 0.333 (as shown in Table B2 of Appendix B). As for pricing plans, the lack of firm-level data on actual prices does not allow for a similar validation exercise. However, once we aggregate firm-level expectations for the manufacturing sector (from the 2017-wave of the MET survey, closed in January 2018) we obtain an expected inflation rate of 1.39%, which is similar to the 1.1% observed inflation for domestic manufacturing goods in 2018.[14] Overall, this evidence suggests that firms' expectations are informative about the future dynamics of the actual variables, and that this is especially true in times of crisis.

In completing the dataset we will use in our empirical work, we match the firm-level surveys with 2018 official balance-sheet data (CRIF-Cribis D&B database) in order to

[13]We use the word effectively because firms were asked to provide a numerical value for expected changes below -5% or above +5%. For values within this range, they could simply indicate no change, even though some firms still provided a numerical answer. Overall, only 20% of the companies in our dataset reported a value of zero and our results are not sensible to their exclusion from the estimating sample.

[14]In aggregating firm-level data we employ sampling weights to reproduce the number of companies in the population and weigh each observation for the level of sales (we will discuss the weighting again in Section 4.1). See https://www.istat.it/it/files//2019/03/PPI_CPP_PPS_0219_IVtrim18.pdf for the Producer Price Index. Note that, because price expectation data is available only from the 2017 wave, we cannot perform aggregate validation exercises for earlier periods.

control for predetermined firm's characteristics such as size and age. As a result of this matching, the estimating sample was reduced by roughly 35%, resulting into a final size of about 5,000 firms.[15]

Finally, we gather data on the geographical diffusion of the pandemic from official releases of the Italian Department of Civil Protection (Presidency of the Council of Minister). This data allows us to explore the consequences of the heterogeneity in the geographical diffusion of the COVID-19 outbreak.[16] In the next subsections we present details of the construction of our main measures for credit constraints, geographical exposure to the pandemic, and sectoral heterogeneity associated with the essential classification of companies. Further details on variable definitions are contained in Table A1, while summary statistics for the firm-level survey and balance-sheet data are presented in Table A2.

3.1 Credit constraints

In constructing our measure for credit constraints we exploit unique information in the 2019 MET survey about bank loan applications. In particular, firms were asked if they applied for a loan in the past year and about the resulting outcome. In case of a loan application, firms were allowed to choose one of the following options: (i) the loan was granted at favorable conditions; (ii) the loan was granted at slightly less favorable conditions; (iii) the loan was granted but at very unfavorable conditions; (iv) the loan was denied. Moreover, in absence of a loan application, the questionnaire asks firms whether they did not apply because: (v) there was no need of external funds; or (vi) they knew the application would have been denied. Exploiting all this information, we have classified as credit constrained those firms that replied either (iii), (iv), or (vi) In other words, we regard a company to be constrained by banks if the loan application was rejected, accepted but at substantially worse conditions, or if the firm did not apply

[15]To reduce the influence of outliers, balance-sheet variables are censored at the 1% and some observations are excluded because of measurement errors (negative or nil assets, negative or nil sales).

[16]Data available from https://github.com/pcm-dpc/covid-19.

because it expected to be rejected. Overall, almost one fifth of the firms in our sample (18%) are classified as constrained.

3.2 Geographical diffusion of the pandemic

In order to explore geographical heterogeneity in the effects of the COVID-19 outbreak, we gather data on the number of positive cases in each province (107 geographical levels) and on the cumulative deaths at the regional level (20 regions). While both variables are measured with errors, the number of deaths is likely to be more precise.[17] We develop a measure of local exposure by imputing the cumulated number of regional deaths to each province within a region, using the proportion of COVID-19 cases in each province. Notice that this measure captures both the perceived and actual epidemiological severity of the COVID-19 outbreak at a provincial level, as deaths and number of positive cases were at the center of the attention of all media outlets. In constructing our measure, we employed data for the day before the interview of each firm, but we also tested other timings with no significant change in our results. We have experimented using different measures of the geographical dimension of the severity of the COVID-19 outbreak and provide a discussion of the results in Footnote 28.

3.3 Essential vs. non-essential classification

Another dimension of heterogeneity in firms' exposure to the COVID-19 shocks is related to the regulatory restrictions on production imposed by the Italian government. While firms operating in essential sectors could remain open throughout the pandemic, companies in sectors that were considered non-essential were forced to shut down. Essential and non-essential firms are defined using the same 6-digit sectoral classification

[17] Individuals who die due to the virus are previously admitted to the hospital and usually tested for the virus. This implies that most of the hospital deaths related to the COVID-19 are recorded. The number of deaths is subject to a downward bias because the government records a death for COVID-19 only if the patient has been tested and that is not necessarily the case when the death occurs at home or at a nursing home. However, since a large fraction of individuals who contract the virus are asymptomatic or have only mild symptoms, they are generally not tested and not recorded as positive cases. This means that the measurement error for the number of positive cases is likely to be greater than the measurement error for the number of deaths.

adopted by the Italian government in the decree of March 22. Moreover, main suppliers to firms in essential sectors were also allowed to stay in business and classified as essential. We can identify this additional set of companies because we have information on whether a firm stayed open despite belonging to a non-essential sector (from the COVID-19 survey). Overall, 59% of the firms in our sample were classified as essential, while 41% of the firms were subject to a forced closure during the lockdown period.

4 Descriptive evidence

This section presents some descriptive statistics for sales and domestic prices growth expectations/plans for the matched (with balance-sheet data) sample of 5,000 firms used in estimation. First, we report the pre and post COVID-19 unconditional distributions and discuss the aggregate implications of the outbreak. We then analyze how changes in expected sales and prices depend upon the financial status of the company or the geographical and sectoral component of the shock. We also describe the joint distribution of expected changes in sales and prices. This preliminary look at the data is meant to identify some potential factors driving the effects of the COVID-19 pandemic on sales and prices, and it is a prologue to the multivariate analysis in Section 5. Since we are interested in the effects of the COVID-19 outbreak on the entire economy, the descriptive evidence presented in this section employs post-stratification weights for the post COVID-19 survey that are calibrated to reproduce the overall Italian industrial structure. These weights may be only approximately correct for the 5,000 firms survey if there are further selection issues generated by matching the survey data with the balance-sheet data.[18] We will discuss this issue in Section 5 (see Footnote 26).

4.1 General consequences of the COVID-19 outbreak

We focus on sales' expectations and price plans as we can rely on two identical questions contained in the original 2019 MET survey and repeated in the March 2020 survey. The

[18] Unless specified otherwise, the picture from the unweighted sample is essentially in line with the one presented. The similarity is even greater when calculating the weighted statistics using the 7,800 firms sample.

first question asks about the expected sales growth over the next 12 months. Firms were allowed to give a categorical answer on the expected change: i. very negative (less than -15%); ii. negative (between -15% and -5%); iii. stable (between -5% and +5%); iv. positive (between 5% and 15%); and v. very positive (more than 15%). As for prices, firms were directly asked for the expected (continuous) percentage change over the next 12 months.

The upper and bottom panels of Figure 1 present the distribution for pre and post COVID-19 expected sales growth over the next year. The leftward shift of the distribution is quite evident, with about 80% of firms reporting either expectations about a contraction (between -5% and -15%) or a large contraction (less that -15%) in sales. Before the COVID-19 outbreak, instead, 60% of firms expected sales to be fairly stable, with about 20% of companies forecasting future increases. Figure 2 shows the same expected dynamics for (discretized) domestic prices. In this case, we observe a rightward shift in the price distribution, with the unweighted mean increasing from 1.1% to 7% in the most recent survey (see also Table A2).[19] If we weight each answer by firms' sales and by the sampling weights –that reproduce the population of companies– we obtain, instead, a moderate aggregate upward revision in expected firms' prices of thirteen basis points (from 2.48% to 2.61%). This preliminary evidence suggests that while both the demand and supply components of the shocks are playing an important role, the supply component is slightly more important in the aggregate. This moderate price response is consistent with the simulation results in Baqaee and Farhi (2020b) and Eichenbaum et al. (2020a). We will return to these issues when discussing whether the price increase is due to a rise in costs or to countercyclical markups.[20]

Note, however, that behind this aggregate figure there is a very heterogeneous experience across individual firms. This heterogeneity extends to the correlation between expected sales and price changes, as can be seen by calculating the joint distribution of

[19]The Kolmogorov-Smirnov test indicates that we can reject the hypothesis of identical pre and post distributions for expected sales and prices growth with a p-value approximately equal to zero. Some care should be used in interpreting the result for sales because of the reduced accuracy of the test with a categorical variable.

[20]See Sections 4.2, 5.2, and 5.4.

prices and sales changes. In the first panel of Table 1 we report the percentage of firms, over the entire sample, indicating price increases, stability, or decreases conditional on the categorical expectations for sales. A plurality of firms indicates that they expect a decrease in sales and an increase in prices (32.7%). This represent almost half (44.9%) of the firms that expect sales to decrease. The percentage of those indicating no price changes or negative price changes and a fall in sales are smaller but still sizable: 24.7% and 15.4%, respectively (33.9% and 21.1% of the firms expecting a decrease in sales). This means that, whereas most of the firms expect a decrease in sales (72.8%), the price response to the COVID-19 outbreak is heterogeneous. This suggests that the relative importance of demand and supply shocks differs across types of firms. We will explore this heterogenity in the descriptive statistics that will follow and in our econometric analysis.

Finally, Figure 3 shows the discretized distribution of sales expectations over the next three months together with sales expectations over the next 12 months calculated from the continuous measures of sales provided by the supplemental post COVID-19 survey. The two distributions show that the COVID-19 shock is associated with a fall in expected sales at all horizons. In addition, the expected decrease in sales over the next three months (-23.9%) is larger that in the next 12 months (-19.3%). This implies that firms in our sample expect a steep initial fall followed by a very slow recovery. We obtain the same qualitative results when we use the expected fall in sales weighted with their initial level and with sample weights (-15.5% and -10.2%, respectively). We conclude that over this time horizon here is evidence of very asymmetric V-shaped expectations or a L-shaped rotated few degrees counter-clock wise.

4.2 Role of financial frictions

This subsection provides some preliminary evidence on how financial frictions affect firms' sales and price expectations in the aftermath of the COVID-19 outbreak. The upper panel of Figure 4 reports the post COVID-19 distributions for both types of firms' sales expectations. More than 60% of financially-constrained firms expect sales to decrease by more than 15% versus around 45% of unconstrained firms. The comparable histograms for domestic price plans is shown in the bottom panel of Figure 4. Although visually it is not easy to detect a change, the average increase in expected price for financially-constrained firms is 8.2%, while for financially unconstrained firms is only 6.8%.[21] This represents *prima facie* evidence of different pricing decisions depending upon the severity of financial frictions.[22] This picture is confirmed if we look at the joint distribution of expected sales and price changes. The percentage of firms expecting price increases when sales are expected to decrease is higher for credit-rationed firms: 42.5%, versus 32.7% for the entire sample (see Table 1 Panel 2).

4.3 Geographical and sectoral heterogeneity

In this subsection we present some descriptive evidence on the geographical and sectoral heterogeneity of the COVID-19 outbreak and on its effects. Figure 5 displays the heterogeneity in the number of cumulative deaths across the Italy. While some provinces in the North suffered from a large number of deaths, the pandemic was significantly less severe in Central and Southern regions, although there is substantial variation also within these macro areas. In the top panel of Figure 6 we exploit this geographical heterogeneity to further explore the effect of the COVID-19 outbreak on expected sales growth, depending upon the level of exposure to the pandemic. High exposure is defined as being located in a province in the top quartile of the distribution of deaths. In high mortality areas, firms are more pessimistic about sales than in provinces with lower exposure (53.4% vs. 47.2% expect a fall in sales below 15%). Although we do not present the graph, prices are expected to increase more in areas with high exposure to COVID-19: the average expected change is 9.3% versus 6.2% in low exposure areas. Moreover, the percentage of firms planning price increases when sales are expected to

[21] The Kolmogorov-Smirnov test indicates that we can reject the hypothesis of identical revisions of sales and price growth expectations between financially constrained and financially unconstrained firms (p-value of less than 1%).

[22] Note that the differences between credit and not credit-constrained firms are much smaller for pre COVID-19 expectations. We do not report the figures for reason of space. A similar remark applies when we partition the sample by firms located in area with a high number of deaths and essential/non-essential firms.

decrease is higher for firms located in high COVID-19 death area: 41.5%, versus 32.7% for the entire sample (see Table 1 Panel 4).

In the bottom panel of Figure 6 we report the post COVID-19 expectations of future sales for essential and non-essential firms. Non-essential firms are on average more pessimistic than essential companies: 52.7% of firms that shut down expect a fall in sales greater than 15%, while only 38.6% of essential firms expect such a large fall. As for prices, there is no evidence of a significant difference in the average expected change for essential and non-essential companies.[23] The percentage of firms planning price increases when sales are expected to decrease is somewhat higher for essential firms: 35.6%, compared to 32.7% in the entire sample (see Table 1 Panel 7).

4.4 Firms' actual response to the shock

Although the emphasis of the paper is on firms' expectations and plans, it is also interesting to briefly discuss the actions they have taken or were forced to take in response to the COVID-19 outbreak.

Figure 7 shows the percentage of firms that: (i) adopted teleworking; (ii) temporarily reduced employment or (iii) hours worked; were in (iv) complete or (v) partial shutdown; (vi) applied for government programs. Firms were allowed to choose up to three categories in the list. Importantly, almost 50% of the firms decided to temporarily shut down (this is also a result of the restrictions imposed by the government) while only a negligible fraction of them have been willing to partially shut down. Note that we use the information on not shutting down in non-essential sectors to finesse our definition of who is classified as an essential firm. In addition, a large group of firms (30.9%) adopted teleworking, and more firms opted for reducing the hours worked (21.4%) rather than reducing the level of employment (12.1%). The more prevalent use of reductions in hours most likely reflects the fact that firms would rather avoid

[23] The Kolmogorov-Smirnov test suggests that the revision in sales growth is significantly different for essential versus non-essential firms, while it is not significantly different for the exposure to deaths. The caveat of using the Kolmogorov-Smirnov test for categorical variables still applies. For the revision of prices across our geographical or sectoral partition, we cannot reject the hypothesis that the two distributions are identical.

separating permanently from their employees. The use of teleworking by firms raises the issue of its efficiency relative to on-site work. If the two modes are not perfect substitutes moving to teleworking constitutes an adverse cost shocks.

5 Econometric strategy and results

In our empirical work we take advantage of the availability of pre and post COVID-19 expectations for sales and prices (at a one-year horizon) to model the revision in firms' expectations around the COVID-19 outbreak in Italy, that was largely unanticipated. For other continuous variables, such as sales over the next three months, orders, employment, and investment over the next 12 months, we do not have the correspondent expectations formed before the COVID-19 episode. In this case, we will use past expectations for sales to control for the pre COVID-19 information set. Recall that the two surveys where taken only two months apart and, therefore, we assume that they reflect expectations in the yearly growth rate over approximately the same time horizon. The short length of the interval also motivates our assumption that the pandemic is the dominant factor in determining firms' expectation revisions.

In specifying our estimating equation, we assume that the innovation in expectations about marginal net returns generated by the shocks described above is the sum of: a common component η_t; a component that is proportional to the log of one plus the number of deaths at a provincial level, $\text{Deaths}_{i,t}$; and a component that reflects the essential or non-essential status of the firm, $\text{Essential}_{i,t}$. We assume that the effect of these three components on a firm's decisions depend upon whether or not it was credit constrained at time $t-1$, $\text{CC}_{i,t-1}$. More specifically, our empirical estimation will be based on variants of the following model:

$$\begin{aligned}&\mathbb{E}^i(y_{i,t+1}|\text{post COVID-19}) - \mathbb{E}^i(y_{i,t+1}|\text{pre COVID-19}) = \alpha(\text{CC}_{i,t-1})\eta_t \\ &+ \beta_1(\text{CC}_{i,t-1})\text{Deaths}_{i,t} + \beta_2(\text{CC}_{i,t-1})\text{Essential}_{i,t} + \gamma' x_{i,t-1} + \lambda_s + \lambda_r + \varepsilon_{i,t}\end{aligned} \tag{1}$$

where $y_{i,t+1}$ represents the growth rate of sales, prices, orders, employment, investment in tangible assets, and investment in intangible assets of firm i between periods t and $t+$

1; and $\mathbb{E}^i(y_{i,t+1}|\mathcal{I})$ denotes the expectations formed by firm i on $y_{i,t+1}$ with information set $\mathcal{I} = \{\text{pre COVID-19}, \text{post COVID-19}\}$.

In the model we also control for a set of firms' characteristics and initial conditions $x_{i,t-1}$. We will start from a simple specification where $x_{i,t-1}$ is composed of the log of total assets ($\text{Size}_{i,t-1}$), log of one plus age ($\text{Age}_{i,t-1}$), and of log of population at the provincial level ($\text{Population}_{i,t-1}$). The inclusion of $\text{Population}_{i,t-1}$ is meant to make certain that $\text{Deaths}_{i,t}$ does not simply capture the demographic size of the province. In a robustness exercise we also include log provincial value added per capita as a proxy for local productivity and the log number of blood donation per capita as a proxy for social capital, and show that our results for $\text{Death}_{i,t}$ are robust to their inclusion (see the Online Appendix). We also include the pre COVID-19 expectations ($\mathbb{E}^i[y_{i,t+1}|\text{pre COVID-19}]$) to allow the cross-sectional difference in expectation revisions to be related to the initial outlook of the firm. Finally, in a richer specification, we augment the model with a set of dummies indicating whether firm i is importing ($\text{Import}_{i,t-1}$), exporting ($\text{Export}_{i,t-1}$), part of a group ($\text{Group}_{i,t-1}$), family run ($\text{Family}_{i,t-1}$), and investing in R&D ($\text{R\&D}_{i,t-1}$), as well as a continuous variable indicating the percentage of graduate employees ($\text{Graduate}_{i,t-1}$).[24] In all specifications we also include 88 two-digit sector dummies, λ_s, and 20 region fixed effects, λ_r, to account for several sources of sectoral and geographical heterogeneity. Note that the inclusion of a rich set of industrial controls, together with some of the firm-specific measures in $x_{i,t-1}$ (especially size, age, R&D, and internationalization), also capture most of the firms' ability to substitute on-site work with telework.

The inclusion of these controls can be rationalized in two non-mutually-exclusive ways: (a) there may be an additional component of the shock that varies with such firms' characteristics, or (b) the response to the common shocks depends upon such characteristics. Conditional on $x_{i,t-1}$ and the region (λ_r) and sector (λ_s) dummies, we assume that the error term $\varepsilon_{i,t}$ in Equation 1, that captures other unobservable components generated by the COVID-19 pandemic, approximation errors, and measurement

[24] The subscript $t-1$ indicates variables from 2018 balance-sheets or from the pre COVID-19 MET survey.

errors, is uncorrelated with $\text{CC}_{i,t}$, $\text{Deaths}_{i,t}$, and $\text{Essential}_{i,t}$. Under these assumptions, the coefficient on these variables can be estimated consistently.

We estimate our model both with the unweighted and the weighted sample, using the ex post stratification weights for the COVID-19 survey. We use the weighted results as our benchmark throughout the main body of the paper, but present in the Online Appendix the results from the unweighted sample and discuss in the text any difference between the two. On the whole, the results are similar with a limited number of exceptions. We focus on the weighted estimates for two reasons. First, we want results to be as representative as possible of the effects of the COVID-19 outbreak on the overall Italian economy. Second, the weighting scheme assuages concerns about causal inference due to the possible endogenous selection of companies in the sample. The latter may be induced by the very administration of the COVID-19 survey that was concentrated in a short time window during the lockdown. If firms that were less affected by the pandemic, such as those in essential sectors or located in areas with lower deaths, had a higher probability of being sampled and if this selection is correlated with the error terms, the post-estimation weights may help achieving consistency of the estimates (see Solon et al., 2015 for a discussion and further references).[25] As we have noted before, the post-stratification weights were calibrated to reproduce the aggregate population starting from the full set of 7,800 firms interviewed in the COVID-19 survey. Because we focus on the subsample of 5,000 firms with complete balance-sheet data, the weighted analysis may still not be perfectly representative of the manufacturing and productive services sector.[26]

[25]The comparison of weighted and unweighted descriptive statistics in Table A2 provides, indeed, some evidence in favor of an oversampling of companies that were less exposed to the pandemic shock. We also tested the need of sampling weights with the statistic proposed by DuMouchel and Duncan (1983). The test speaks in favor of a weighted estimation because weights and their interactions with the independent variables add significant explained variance to the overall model (p-values are virtually zero).

[26]A Probit model of the probability of appearing in the matched 5,000 sample, conditional on being in the 7,800 firms sample, suggests that the number of deaths does not affect significantly such probability, but being essential increases it, while being financially constrained decreases it. Some of the controls, such as size, are also significant. This suggests that in the estimating sample, relative to the 7,800 firms sample and conditional on the controls, we have firms that in same dimensions (for instance, essential status and financial constraints) tend to be less severely affected by the pandemic.

The structure of the section is as follows. In Sub-section 5.1 we present results for a model where the effect of the geographical and sectoral components ($\text{Deaths}_{i,t}$ and $\text{Essential}_{i,t}$, respectively) do not depend on initial financial conditions. This implies that β_1 and β_2 are assumed to be constant. In Sub-section 5.2 we further explore the role of financing constraints during the COVID-19 outbreak, using this baseline model. In Sub-section 5.3 we relax the assumption on β_1 and β_2 and test whether the effects of $\text{Deaths}_{i,t}$ and $\text{Essential}_{i,t}$ depend on pre COVID-19 credit constrains, $\text{CC}_{i,t-1}$. Finally, in Sub-section 5.4 we add further interactions to discuss additional evidence of the role of markup changes.

5.1 Results from the baseline model

The results presented in this section are based on estimates of the following model:

$$\begin{aligned}\mathbb{E}^i(y_{i,t+1}|\text{post COVID-19}) &= \delta\,\mathbb{E}^i(y_{i,t+1}|\text{pre COVID-19}) + \alpha_0 + \alpha_1\text{CC}_{i,t-1} \\ &\quad + \beta_1\text{Deaths}_{i,t} + \beta_2\text{Essential}_{i,t} + \tilde{\gamma}'\tilde{x}_{i,t-1} + \lambda_s + \lambda_r + \varepsilon_{i,t}\end{aligned} \tag{2}$$

Note that Equation 2 is a re-parameterization of Equation 1 in which we have moved the pre COVID-19 expectations to the right-hand side. Its coefficient δ equals one plus the element of γ associated with the pre COVID-19 expectations in Equation 1. Now, $\tilde{x}_{i,t-1}$ denotes the firms' characteristics excluding the $\mathbb{E}^i(y_{i,t+1}|\text{pre COVID-19})$. In addition, the essential restriction imposed in this equation is that β_1 and β_2 do not depend on firms being financially constrained. Moreover, for notational simplicity we have subsumed η_t into α_0 and α_1.

The first two columns of Table 2 contain the results of OLS models for the one-year ahead expected sales growth (numbered from one to five according to increasing levels of optimism). Columns 3 and 4 report the estimates for ordered logit models for the same variable, while in column 5 we employ the categorical revision in expectations as an alternative dependent variable (post-pre COVID-19).[27] For the first two models, we

[27] In this case, we define nine order categories based on the number of steps the revision can take. For instance, going from the expectation of a change in prices between minus/plus 5% to being very pessimistic (less than -15%) is a two step negative change.

present both a narrow and wide set of control variables $\tilde{x}_{i,t-1}$, while, for the last models, we present results only with the wide set of controls. In all specifications, the geographical component of the shocks generated by the COVID-19 outbreak plays a significantly role, as firms located in a province with a higher number of deaths are affected more negatively than firms in areas with lower exposure. Our interpretation is that the more severe effects are related both to the innovation in the actual and perceived severity of the crisis, as reflected in the reported number of deaths and positive cases.[28] Moreover, the negative effect of the COVID-19 event is significantly attenuated if the firm is classified as essential. This result underlines the importance of the restrictive measures on production taken by the Italian government in shaping the economic effect of the COVID-19 outbreak.

Importantly, firms that were credit constrained before the outbreak are significantly more pessimistic about their future sales. This is consistent with firms decreasing employment and investment due to the financial frictions they face and, hence, decreasing production. This could be also consistent with financially-constrained firms expecting lower price growth, but we will show below that this is not the case. All these results are robust to the choice of the set of control variables. Given the categorical nature of the variables, it is not straightforward to make statements about the size of the effects. We will do so later in Table 4 when we use continuous variables.[29]

[28] We have experimented with several measures of the geographical intensity of the COVID-19 outbreak, in addition to the log of the imputed number of deaths at the provincial level. For instance, we have tested whether log deaths and log population have coefficients which are equal in absolute value and with opposite signs, in which case we could enter the log mortality rate as the only regressor. We cannot reject this restriction for expected sale growth, but we reject it for expected price growth. For this reason we have decided to present the specification in which the restriction is not imposed. Moreover, we have also replaced the reported number of deaths with the number of actual deaths in excess of those that occurred in the same month over the past ten years, which may be a better measure of the actual mortality associated with COVID-19. This variable, independently from how it is entered, is never significant, suggesting that part of the effects of $\text{Deaths}_{i,t}$ reflects the fact that the number of deaths and cases (which we used in imputing to the province level the regional number of deaths) were the figures that received the greater attention in the media. See Table B3 in Appendix B for detailed results. In addition, in the Online Appendix we report a set of results using the log of one plus the number of reported provincial cases as opposed to $\text{Deaths}_{i,t}$. Our basic conclusions still hold but the coefficients are somewhat less precisely estimated than the ones using $\text{Deaths}_{i,t}$.

[29] As a robustness check, we also run a multinomial logit model and the overall message is very similar to one obtained in the case of the ordered logit model. See Table B4 in the Appendix B.

In the first four columns where the dependent variables are the expectations formed after the outbreak the sign of the coefficient of the categorical variable suggests that firms with more pessimistic (optimistic) pre COVID-19 expectations are more (less) likely to be pessimistic about post COVID-19 expected sales. In the fifth column the sign of past expectations is reversed –as one would expect– because the dependent variable is the revision in expectations. As for the other controls, larger firms hold more optimistic expectations about sales. Given size, however, younger firms are more optimistic about the future. The latter result is possibly linked to the higher dynamism and capability of adaptation of young companies. Finally, export-oriented firms hold more pessimistic expectations, possibly because of the global nature of the COVID-19 pandemic, as well as the protectionist and other restrictive measures adopted by national governments.

In Table 3 we analyze the effect of the COVID-19 event on domestic price plans. In terms of included regressors, this specification is similar to the one in Table 2, with the exception of having included lagged expected price changes, as opposed to lagged sales growth, as a control. Since price expectations are continuous, we only estimate an OLS specification. Also in this case, deaths at the province level and credit constraints play an important role for domestic prices: everything else equal, prices tend to be higher in provinces with a higher death rate or for financially constrained firms. The positive coefficient on $\text{Deaths}_{i,t}$ is consistent with supply shocks being more important relatively to demand shocks in the geographical component of the COVID-19 generated shocks. We have also included the essential status of the firm, but its coefficient is never significant. This is somewhat surprising because one might have thought that essential firms faced a less unfavorable cost shocks compared to the non-essential ones. Among the additional controls, size is the only variable that matters for domestic prices, while other variables are statistically not significant.

Quantitatively, as deaths are expressed in units of standard deviation, the results imply that a one-standard deviation increase in the log of deaths (approximately five deaths) raises price growth by approximately 2.5 percentage points. Moreover, a credit-rationed firm will increase price growth between four and six additional percentage points compared to its non-rationed counterpart. This result is consistent with previous theoretical and empirical work with price setting of financially constrained firms. The basic logic is that financially-constrained companies are more likely to put a premium on liquidity as opposed to building up the customer base by charging lower prices (see the seminal papers by Gottfries, 1991 and Chevalier and Scharfstein, 1995, and the recent contribution by Gilchrist et al., 2017).[30]

In the regression model is somewhat surprising that past inflation expectations are not significant. Since the price variable is continuous, we have also tried a specification in which the dependent variable is the difference between the post and pre COVID-19 price plans. Results are reported in column three and six of the table and the results confirm the conclusions we have reached so far.

In order to explore in more details the effects of the COVID-19 pandemic, we now move to Table 4 where we present OLS estimates for the same specification of Table 2, but using a wider set of dependent variables: expected sales at three and 12 months, expected orders, as well as plans for employment, investment in tangibles, and investment in intangibles. These variables allow us to make more precise statements regarding the quantitative effect of the COVID-19 pandemic as they are effectively continuous and expressed in percentage points changes with respect to the pre COVID-19 situation.

Overall, the estimates broadly confirm the results discussed so far. The number of COVID-19 deaths has a negative and significant effect on short-term and long-term sales expectations, but has a sizable impact also on orders and employment. Everything else equal, a one-standard deviation increase in the (log) number of provincial deaths leads to a reduction in firms' expected sales growth of additional 1.7 percentage points, both in the short and in the long run. Similarly, the essential designation is associated with significantly less negative outcomes, with a reduction in the expected fall in sales of approximately ten percentage points.

[30] See also Asplund et al. (2005), de Almeida (2015), Kimura (2013), Lundin et al. (2009), and Montero and Urtasun (2014) for additional evidence supporting this mechanism. Kim (2020), instead, provides evidence that firms facing an adverse financial shock reduce prices in the short run to liquidate inventories and generate cash flow, followed by a price increase in the medium run.

Most importantly, being credit constrained negatively and significantly affects all the variables, with only the investment in tangibles being significant at the 10% level. The effect of financial frictions is particularly important over the next three months, with a fall in expected sales for credit-constrained firms that is 15% greater than the one for unconstrained companies. This difference is somewhat reduced over the 12-months horizon, although it is still quite sizable (8%). Note that the inclusion of past sales expectations as a control is perfectly appropriate for sales expectations at 12 months and approximately so for the other dependent variables. In terms of the additional controls, the important role of size and, sometimes, age for many of the dependent variables is confirmed. Finally, the coefficients of family ownership, import, or export status are very rarely significant.

Our results are robust to several variations. First of all, unweighted analyses broadly confirm our conclusions, with a few exceptions that is worth highlighting (see the Online Appendix, Tables C1-C3). While the effect of $\text{Deaths}_{i,t}$ is still positive and sizable for prices, the effects on the other dependent variables are insignificant in this framework. Note, however, that $\text{Deaths}_{i,t}$ will play a role for expected sales even in the unweighted sample when interacted with credit constraints, as we will discuss in Section 5.3. Moreover, the negative effect of $\text{Essential}_{i,t}$ becomes more significant in the price equation. In addition, results are also robust to: (i) removing from the dataset the firms that did not report an actual figure for the minus/plus five percent categories of the effectively continuous variables, instead of imputing a to them a value of zero; (ii) using a common information set on $\text{Deaths}_{i,t}$ to all firms (the imputed provincial deaths in the day that preceded the start of the survey); (iii) controlling for provincial measures of social capital (log number of blood donations per capita) and productivity (log value added per capita); (iv) defining essential nature of the firms based on the March 11, 2020 government classification instead of March 22, 2020 classification; and (v) clustering at the industry level as opposed to the province level. See the Online Appendix for detailed results.

5.2 More evidence on financial constraints

In this section we provide additional evidence on the role of financial factors and bank relationship in investment, employment, and output decisions, and on the determinants of financing constraints.

In Table 5 we replace the pre COVID-19 credit constraint dummy with a set of firm-level balance-sheet variables and survey information on the nature of firm-bank relationship. More specifically, we introduced the past share of liquid assets (Liquidity$_{i,t-1}$), cash flow (Cash Flow$_{i,t-1}$), the ratio between fixed assets and total assets (Tangible Assets$_{i,t-1}$), leverage (Leverage$_{i,t-1}$), and net accounts payable (Trade Credit$_{i,t-1}$). Moreover, we also include the number of lender banks (N of Lender Banks$_{i,t-1}$), the length of the relationship with the main bank (Lending Relationship (years)$_{i,t-1}$), and the distance from the latter (Distance Lender Bank$_{i,t-1}$). Across all dependent variables, the strongest association is with the stock of liquid assets: firms that entered the pandemic outbreak with greater liquidity tend to have more favorable expectations and plans. Its effect is significant for sales expectations at three and 12 months, orders, and employment. Interestingly, the coefficient of liquidity is larger for expectations at a three-month horizon which emphasizes firms' need of financial slack in order to survive and deal with the COVID-19 shock in the short run. Liquidity is only significant at the 10% level for investment in intangibles and not significant for tangible investments. As for the other regressors, we document a sizable effect of asset tangibility for sales expectations over the next 12 months and of the length of lending relationship for sales expectations over a three-month horizon. The role of liquidity as a buffer against falls in net revenue is very relevant from a policy perspective, as it underscores the importance of lending facilities that provide liquidity to firms. Finally, the variable Essential$_{i,t}$ is significant at the 1% level across all the dependent variables, while Deaths$_{i,t}$ remains strongly significant for sales over the next three and 12 months and orders, but less so for employment.

In Table 6 we investigate the determinants of being credit constrained after the pandemic outbreak using a linear probability model. The dependent variable is a dummy that equals one if in the COVID-19 survey the firm mentions credit constraints as one of the main adverse factors it faces. Again, having liquidity at the end of 2018 is negatively associated with a probability of being financially constrained and so is cash flow received during the year. In some specifications, highly-leveraged companies have a larger probability of being credit rationed after the pandemic, while the ability to obtain trade credit reduces the likelihood of being constrained.[31] There is also persistence in the credit-constrained status in the sense that past credit constraints (measured from the 2019 MET survey) increase the probability of being constrained in the COVID-19 crisis, while bank-relationship variables do not appear to play an important role. The coefficient on $\text{Deaths}_{i,t}$ remains strongly significant while the essential status does not seem to have an effect, which is somewhat surprising.

Overall, our evidence highlights the critical role of liquidity either for the probability of being constrained or for firms' expectation and plans. Our results are consistent with the evidence in Acharya and Steffen (2020) who show that during the COVID-19 pandemic the US stock market had a higher valuation for firms with access to liquidity through cash holdings and credit lines. Our evidence is also in line with Ramelli and Wagner (2020) who stress the role of leverage and internal liquidity as important value drivers. All these results provide support for the policy prescription discussed in Draghi (2020) who emphasizes the importance of providing liquidity facilities to firms in the aftermath of the COVID-19 pandemic to avoid a deep recession. They are also supportive of the policy actions by the Italian government that provide a guarantee for lending by banks to domestic firms.

5.3 Model with interactions

We now explore a richer specification of our model that allows for interactions between financing constraints, the local severity of the COVID-19 pandemic, and the essential designation of the firm. Adding these interactions allows the effect of credit constraints

[31] Giannetti et al. (2011) suggest that trade credit is a relatively cheap form of finance for many Italian firms. Their findings also challenge the idea that the use of trade credit signals the inability to access bank credit.

to differ geographically, as captured by deaths at the provincial level, or by sectors as captured by the essential dummy (or later by other sector characteristics such as concentration and firms' entry and exit). The estimated equation is now:

$$
\begin{aligned}
&\mathbb{E}^i(y_{i,t+1}|\text{post COVID-19}) = \delta\,\mathbb{E}^i(y_{i,t+1}|\text{pre COVID-19}) + \alpha_0 + \alpha_1 \text{CC}_{i,t-1} \\
&+ \beta_{1,0}\text{Deaths}_{i,t} + \beta_{1,1}\text{CC}_{i,t-1} \times \text{Deaths}_{i,t} + \beta_{2,0}\text{Essential}_{i,t} + \beta_{2,1}\text{CC}_{i,t-1} \times \text{Essential}_{i,t} \\
&+ \tilde{\gamma}'\tilde{x}_{i,t-1} + \lambda_r + \lambda_s + \varepsilon_{i,t}
\end{aligned} \tag{3}
$$

In Tables 7, 8, and 9 we reproduce the specifications of the models in Tables 2, 3, and 4 with additional interaction terms. For sales, prices, and expectations about factor demand the coefficients of these interaction terms tend to be mostly not significant, which justifies our choice to start from the simpler version of the model. Our fundamental conclusions are largely confirmed. Nevertheless there are some very interesting exceptions. In particular, the coefficient of the interaction between credit constraints and essential is significant in the ordered logit model for sales, and in the continuous model for investment in tangibles and intangibles. The coefficient of the interaction term between credit constraints and deaths is significant for the expectation of sales over the next three months. There is, therefore, evidence that financing constraints amplify also the geographical or sectoral component of the shocks. As far as prices are concerned, the geographical dimension of the pandemic does not appear to be important in determining the effect of credit constraints, while being essential reduces the effect of credit constraints on prices. A possible explanation is that non-essential firms expect to be in worse financial shape and plan to have higher prices in order to generate liquidity.

If we compare these results with unweighted estimates, our conclusions are again mostly unchanged. Note that in this case $\text{Deaths}_{i,t}$, when interacted with credit constraints, plays a role for expected sales over the three-month horizon. In addition, in the price equation, the coefficient of credit constraints interacted with $\text{Deaths}_{i,t}$ is now significant, while the impact of the interaction of credit constraints with $\text{Essential}_{i,t}$ is not significant (see the Online Appendix, Tables C4-C6).

5.4 More on markup changes and COVID-19

So far, we have emphasized the role of credit constraints in the transmission of the shocks and showed that constrained firms reduce sales and factor demand and increase prices more in the aftermath of the COVID-19 outbreak. As discussed in Section 2, financing constraints is just one of the mechanisms that lead to a countercyclical markup. Another explanation can be based on collusive oligopoly models. In that case, markups may be countercyclical because firms are less likely to collude during booms: when demand is high the benefit from deviating from the collusive equilibrium increases, hence the latter can only be supported if prices and markups are low (Rotemberg and Saloner, 1986; Rotemberg and Woodford, 1991; Rotemberg and Woodford, 1992; Rotemberg and Woodford, 1993). Moreover, when entry and exit is possible, the markup may be countercyclical because changes in the number of firms over the cycle affect the degree of competitiveness in a sector. Therefore, in periods of low demand prices may rise relatively to marginal cost, while the opposite can occur in a boom (Chatterjee and Cooper, 1989; Chatterjee et al., 1993; Bilbiie et al., 2012).

In order to assess whether these explanations for countercyclical markup are in play in the aftermath of the COVID-19 episode, we conduct a set of empirical exercises. Since the collusive oligopoly story is likely to be more relevant for concentrated sectors, we ask whether the coefficient of the sector dummies are significantly related to measures of concentration such as the Herfindahl-Hirschman Index in 2018 (HHI).[32] We start by focusing on the second column of Table 8 and document that the coefficients of the sector dummies are significantly different from one another (the p-value of this hypothesis is virtually zero). We then regress the estimates of the two-digit effects on the HHI index and show that industrial concentration is not significantly associated with the coefficients of the sectoral dummies (the t-statistic equals -0.34). Similarly, there is no significant relationship between the coefficients of the sectoral dummies and the demographic characteristics of a sector. For instance, when we use churning (defined

[32]Note that the main effect of the concentration index at the two-digit level is captured by the sector dummies. The HHI index is computed at the two-digit level on the universe of firms with balance sheets in 2018.

as the sum of exits and new entries in 2018 as a proportion of the initial number of firms) in this regression its coefficient is not significant (the t-statistic equals 0.01).[33] The same is true if we employ the mortality rate, instead, as the relevant measure of firms' dynamics during the downturn generated by the COVID-19 crisis. Finally, we do not find any effect even when we test the joint significance of HHI and churning (the p-value of the f-test equals 0.939). Therefore our analysis provides no evidence in favor of a direct effect of these two mechanisms on the markup in the aftermath of the COVID-19 outbreak.

As an additional exercise, we ask whether concentration or firms' dynamics affect the role of financing constraints in firms' pricing strategies. In Table 10 we explore a richer specification of Equation 3 that allows also for the interaction of financing constraints with concentration and churning in the sector in which the firm operates. We find that credit-constrained firms in more concentrated markets tend to have relatively higher price increases compared to their credit-constrained counterparts in less concentrated markets. This is probably because those firms find it easier to increase prices to boost liquidity in markets where they have greater market power. Analogously, credit-constrained firms in markets with more churning plan to rise prices relatively more. A way to rationalize this result is that firms operating in a sector with higher probability of exit discount the future more and are more willing to lose a share of their customers in order to boost current liquidity.

As neither concentration nor firm churning explain the effect of the sector dummies, it appears that increases in the markup for firms that are not financially constrained is not the reason for expected price increases following the COVID-19 pandemic. Note that this set of firms represent the vast majority in our sample (82%). As in the aggregate we observe a mild increase in inflation, taken together, these results suggest that the increase in cost is marginally more important than the decrease in demand. It is likely that the COVID-19 crisis generated a substantial increase in cost through several channels, as well as a large fall in demand, leading to moderate price changes. This

[33] We computed two-digit demographic indices (churning and mortality rate) from the universe of registered companies in the 2018 Infocamere database.

result is consistent with the calibrated macro models such as Baqaee and Farhi (2020b) and Eichenbaum et al. (2020a) that generate a large fall in output and a moderate response of prices. Our evidence is also largely consistent with those obtained by Bekaert et al. (2020) and Brinca et al. (2020) who show the importance of both supply and demand shocks in determining the response to COVID-19 outbreak using structural VAR models.

6 Conclusions

In this paper we analyze the effects of the Coronavirus outbreak on Italian firms using unique survey data on pre and post COVID-19 expectations and plans. The anticipated negative economic effect of the pandemic is amply confirmed. The COVID-19 event is associated with a decrease in expected sales (at all horizons), orders, employment, and investment, and with a large fraction of firms expecting to charge higher prices.

There is strong evidence pointing to the importance of financial frictions in amplifying the effects of the shocks associated with the COVID-19 outbreak: credit-constrained firms hold more pessimistic expectations about future sales and orders, and plan to reduce employment and investment more, relatively to unconstrained firms. In addition, those firms expect to increase prices more than firms that suffer less from financial frictions. The search for and availability of liquidity is a key determinant of firms' plans in the aftermath of the negative shocks associated with the Coronavirus pandemic. Moreover, our evidence shows that firms in areas more severely affected by the COVID-19 epidemic and are considered non-essential display more pessimistic expectations and plans. Finally, it appears that expected increases in markups following the COVID-19 epidemic for firms that are not financially constrained (the vast majority of firms) is not the reason why we observe an increase in prices. Thus, the large fall in sales and in factor demand, together with the moderate increase in prices that we have observed is likely to be the result of the COVID-19 crisis generating negative supply shocks that are quantitatively slightly more important than the negative demand shocks.

There is much more to learn about the effects of the COVID-19 outbreak on firms' strategies and decisions. Its effect will be felt not only on quantity and prices but also on the very organization of the firm and on the nature of its relationship with other firms. One important topic worth investigation is the effect of the COVID-19 pandemic on the supply chain and on its domestic and international structure. Another is its effect on the firms' pricing strategies in export markets. These topics are part of our research agenda, but they are left for future papers.

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7 Figures

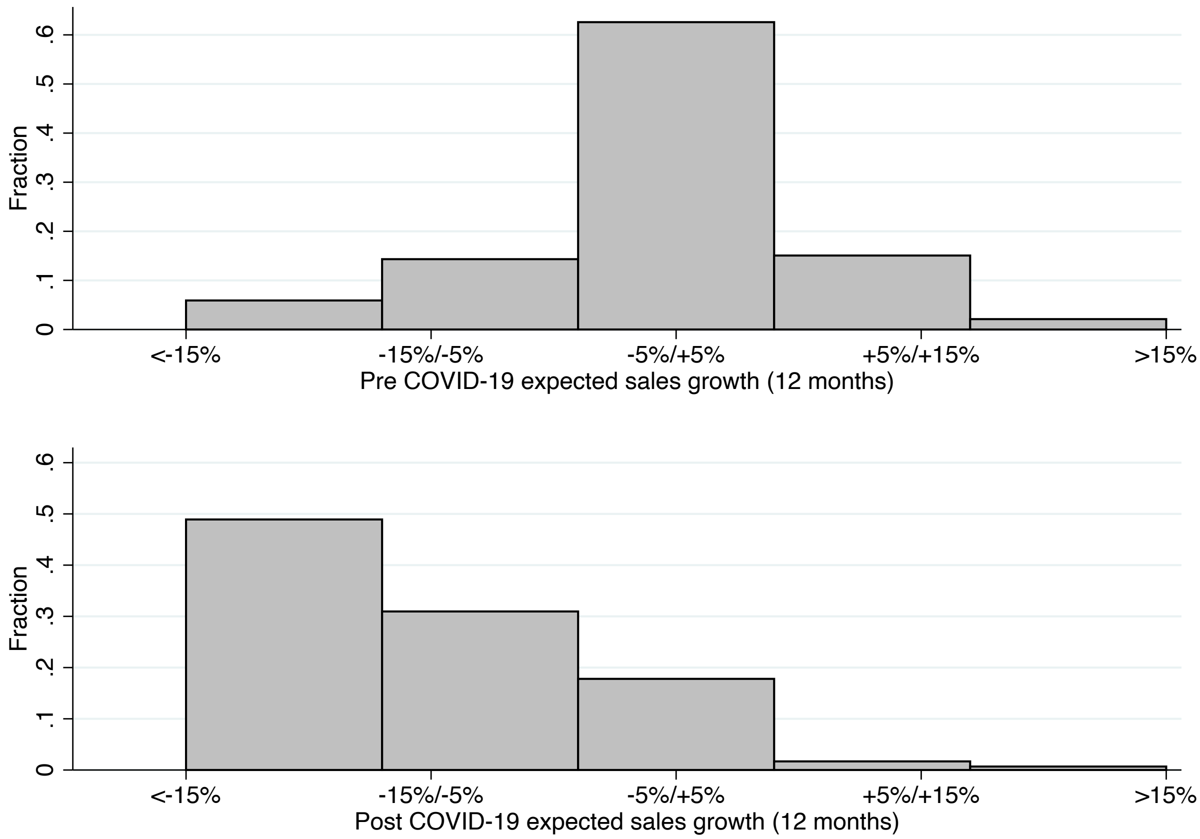

Figure 1: Pre and post COVID-19 expected sales growth

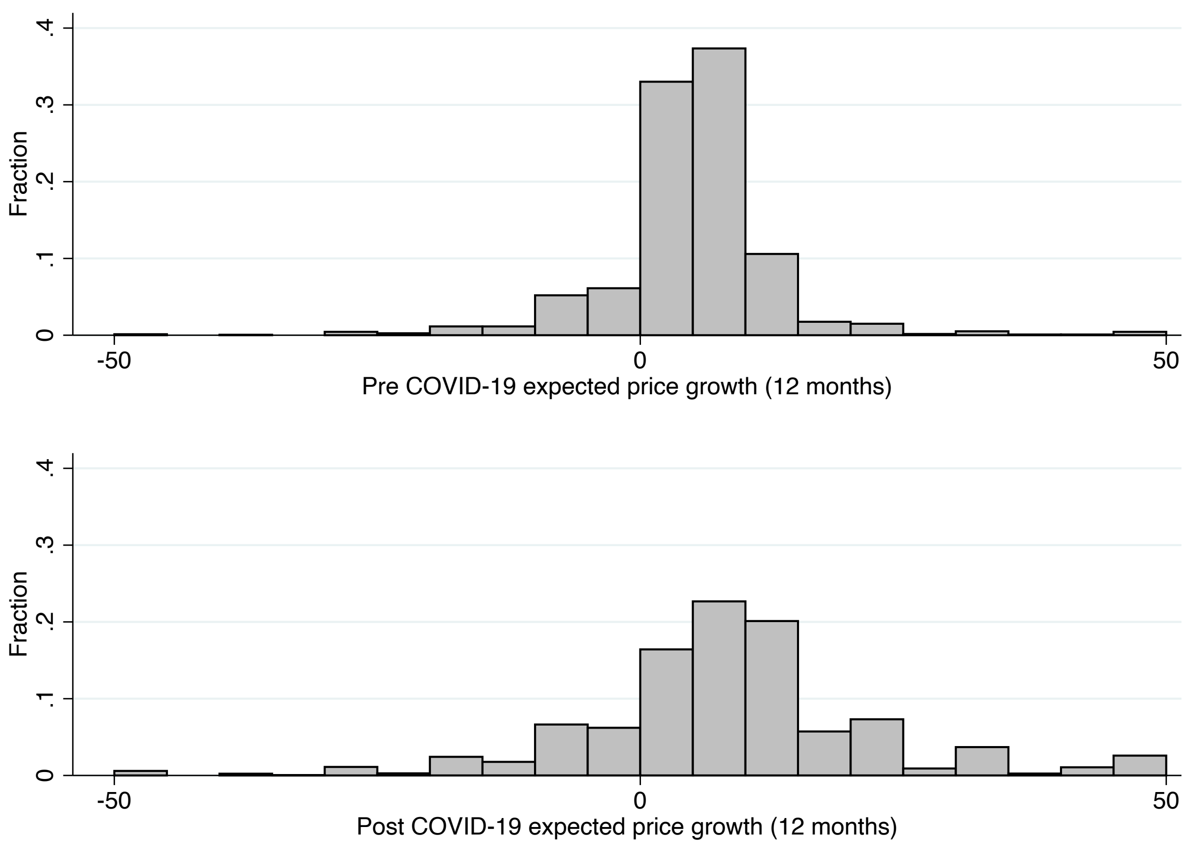

Figure 2: Pre and post COVID-19 expected price growth

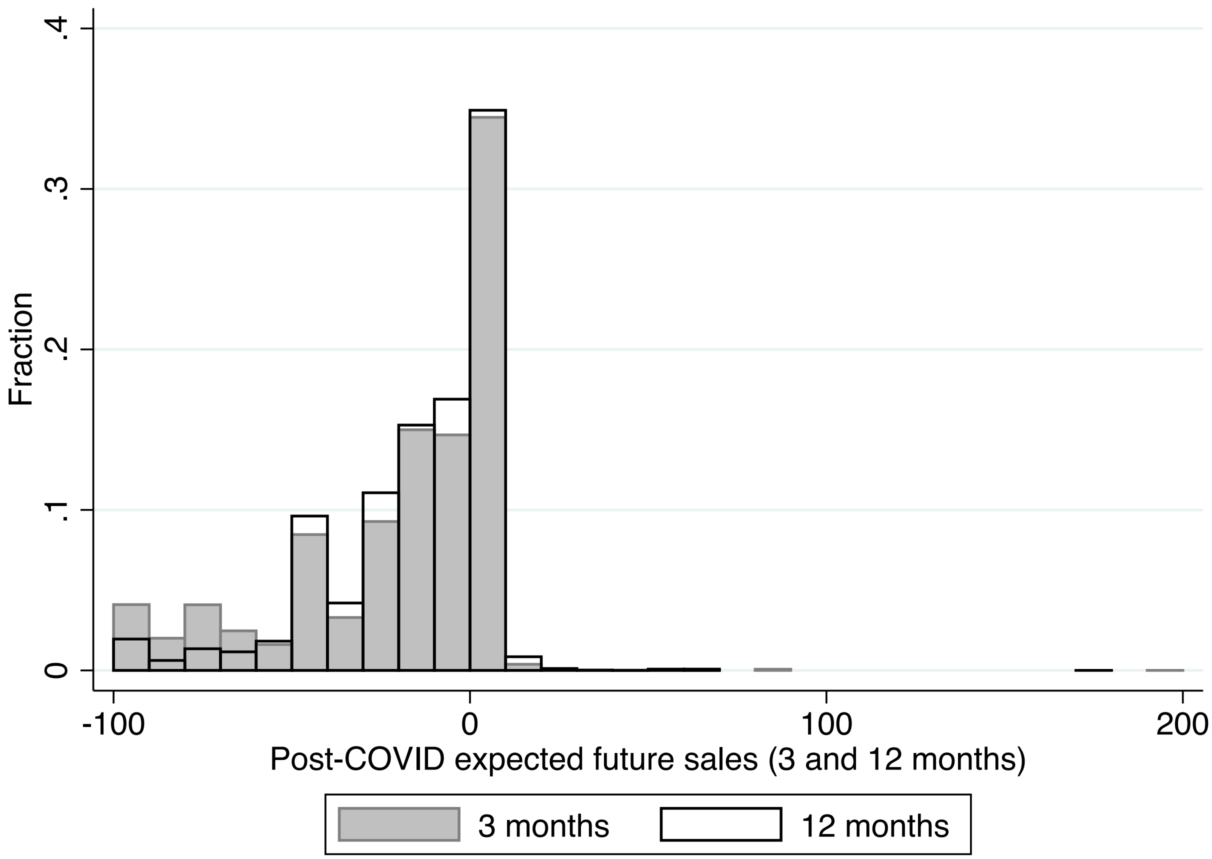

Figure 3: expected sales growth at three and 12 months

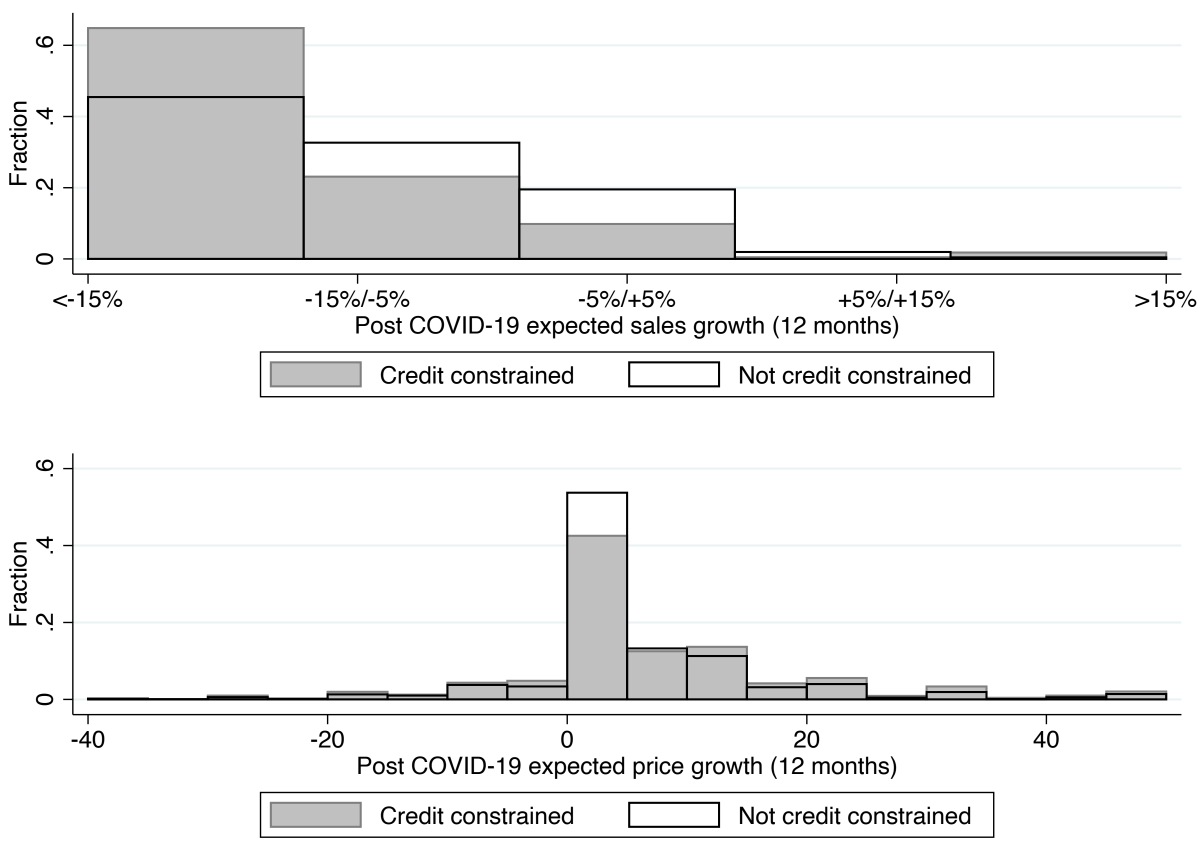

Figure 4: Post COVID-19 expected sales and price growth by credit-constrained status

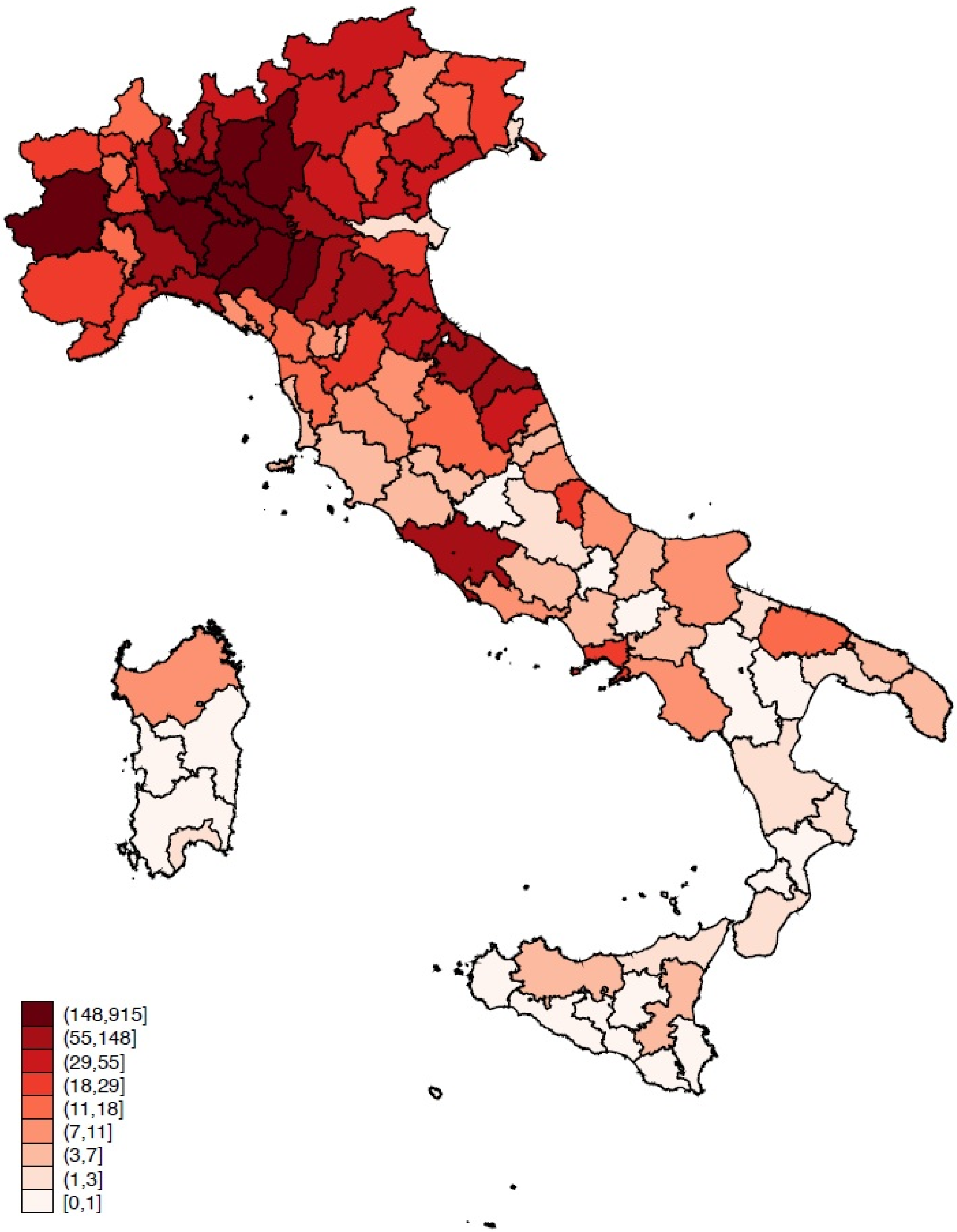

Figure 5: COVID-19 deaths by province

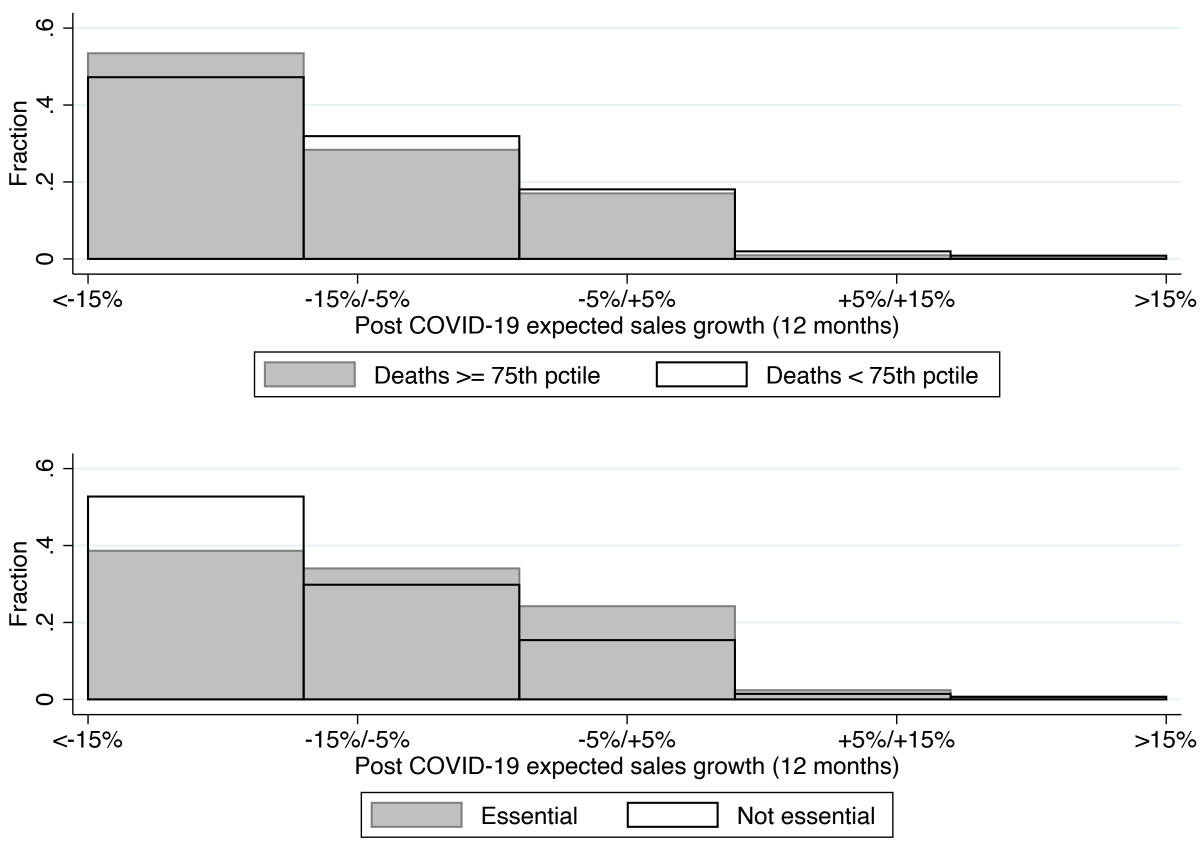

Figure 6: Post COVID-19 expected sales growth by Deaths and by Essential designation

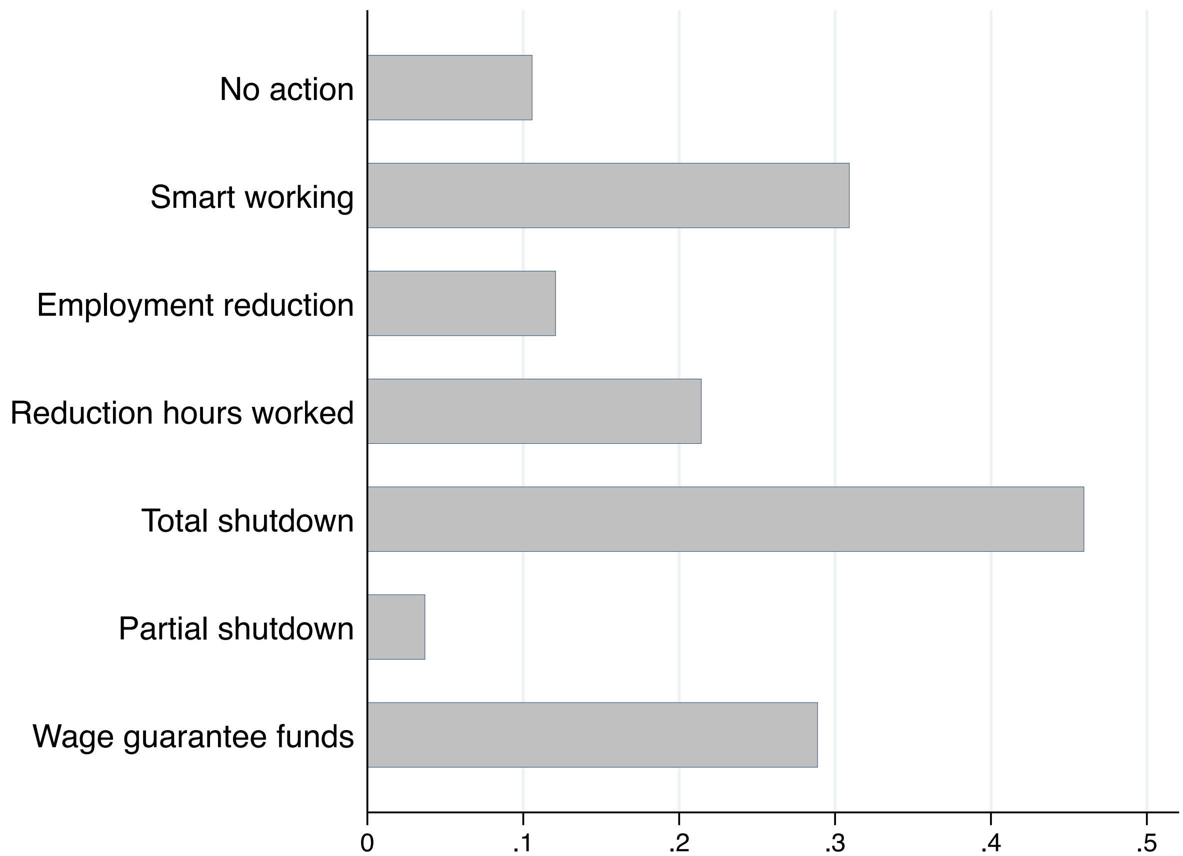

Figure 7: Measures adopted in response to COVID-19 outbreak

8 Tables

Table 1: Joint distribution of revision in expected sales and price growth

	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) < 0$	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) = 0$	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) > 0$
		Entire sample	
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) < 0$	15.4%	24.7%	32.7%
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) = 0$	5.97%	10.6%	7.02%
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) > 0$	0.57%	1.32%	1.58%
		Credit constrained	
	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) < 0$	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) = 0$	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) > 0$
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) < 0$	17.3%	15.6%	42.5%
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) = 0$	5.79%	9.13%	6.02%
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) > 0$	1.04%	2.03%	0.65%
		Not credit constrained	
	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) < 0$	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) = 0$	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) > 0$
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) < 0$	15.1%	26.4%	31.0%
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) = 0$	5.99%	10.9%	7.20%
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) > 0$	0.49%	1.19%	1.74%
		Deaths >= 75th pctile	
	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) < 0$	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) = 0$	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) > 0$
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) < 0$	13.6%	23.6%	41.5%
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) = 0$	4.28%	6.47%	5.23%
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) > 0$	0.34%	1.30%	3.58 %
		Deaths < 75th pctile	
	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) < 0$	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) = 0$	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) > 0$
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) < 0$	16.1%	25.2%	29.2%
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) = 0$	6.65%	12.3%	7.74%
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) > 0$	0.66%	1.33%	0.76%
		Essential	
	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) < 0$	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) = 0$	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) > 0$
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) < 0$	14.1%	24.7%	31.0%
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) = 0$	7.67%	12.4%	6.55%
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) > 0$	0.39%	1.75%	1.38%
		Not essential	
	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) < 0$	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) = 0$	$\Delta^R\mathbb{E}_{i,t}(\text{P}^g) > 0$
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) < 0$	17.5%	24.8%	35.6%
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) = 0$	3.22%	7.82%	7.78%
$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y}) > 0$	0.87%	0.62%	1.91%

Notes: $\Delta^R\,\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y})$ denotes the revision in pre and post COVID-19 expectations for sales growth; $\Delta^R\,\mathbb{E}_{i,t}(\text{P}^g)$ denotes the revisions in pre and post COVID-19 expectations for firm-level price growth. Both variables refer to the 12-month horizon forecast.

Table 2: Baseline Model for Expected Sales Growth

Model	OLS		Ordered Logit		
Dependent variable:	$\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y})$	$\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y})$	$\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y})$	$\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y})$	$\Delta^R\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y})$
	(1)	(2)	(3)	(4)	(5)
Deaths	-0.0484***	-0.0466***	-0.123**	-0.122**	-0.118**
	[0.0180]	[0.0177]	[0.0551]	[0.0554]	[0.0524]
Essential	0.407***	0.396***	1.140***	1.123***	1.111***
	[0.0508]	[0.0535]	[0.148]	[0.160]	[0.149]
Credit constrained	-0.194**	-0.187**	-0.668**	-0.667**	-0.553**
	[0.0834]	[0.0774]	[0.293]	[0.273]	[0.225]
$\mathbb{E}_{i,t-1}(\text{Sales}^g 1\text{Y})$: Very Negative	-0.290**	-0.306***	-1.051*	-1.118*	4.661***
	[0.117]	[0.116]	[0.603]	[0.595]	[0.391]
$\mathbb{E}_{i,t-1}(\text{Sales}^g 1\text{Y})$: Negative	-0.356***	-0.353***	-1.173***	-1.155***	1.553***
	[0.0738]	[0.0715]	[0.273]	[0.261]	[0.187]
$\mathbb{E}_{i,t-1}(\text{Sales}^g 1\text{Y})$: Positive	0.0633	0.0720	0.176	0.206	-2.623***
	[0.0670]	[0.0714]	[0.172]	[0.190]	[0.250]
$\mathbb{E}_{i,t-1}(\text{Sales}^g 1\text{Y})$: Very Positive	0.356**	0.371*	0.635	0.702	-5.018***
	[0.178]	[0.189]	[0.412]	[0.448]	[0.619]
Size	0.120***	0.124***	0.332***	0.345***	0.348***
	[0.0172]	[0.0182]	[0.0530]	[0.0565]	[0.0524]
Age	-0.111***	-0.101***	-0.328***	-0.304***	-0.287***
	[0.0330]	[0.0317]	[0.0967]	[0.0942]	[0.0962]
Population	0.0198	0.0188	0.0378	0.0296	0.0354
	[0.0319]	[0.0318]	[0.0978]	[0.0987]	[0.0917]
Import		-0.00289		0.0341	0.0109
		[0.0651]		[0.190]	[0.188]
Export		-0.210***		-0.634***	-0.640***
		[0.0573]		[0.169]	[0.161]
Group		0.108		0.257	0.346
		[0.107]		[0.302]	[0.311]
Family Firm		-0.0941		-0.223	-0.228
		[0.0649]		[0.181]	[0.187]
% Graduated Empl.		-0.00117		-0.00356	-0.00358
		[0.00103]		[0.00299]	[0.00302]
R&D		0.0710		0.195	0.180
		[0.0653]		[0.194]	[0.180]
Region FE	✓	✓	✓	✓	✓
Industry (2 Digit) FE	✓	✓	✓	✓	✓
R-squared (Pseudo R2)	0.257	0.270	(0.145)	(0.153)	(0.244)
N obs.	5008	5008	5008	5008	5008

Notes: $\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y})$ denotes the post COVID-19 expectations for sales growth over a 12-month horizon. For the definition of the explanatory variables see Table A1. Weighted OLS and ordered logistic estimates. Standard error (in square brackets) clustered at the province level. *, **, *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

Table 3: Baseline Model for Expected Price Growth

Dependent variable:	$\mathbb{E}_{i,t}(\mathrm{P}^g)$	$\mathbb{E}_{i,t}(\mathrm{P}^g)$	$\Delta^R\mathbb{E}_{i,t}(\mathrm{P}^g)$
	(1)	(2)	(3)
Deaths	2.662***	2.529***	2.805***
	[0.889]	[0.815]	[0.840]
Essential	-1.813	-2.189	-2.578
	[2.668]	[2.485]	[2.705]
Credit constrained	4.412**	4.480**	5.801***
	[1.969]	[2.005]	[2.081]
$\mathbb{E}_{i,t-1}(\mathrm{P}^g)$	0.122	0.134	
	[0.0893]	[0.0933]	
Size	-1.016***	-0.880**	-1.030***
	[0.345]	[0.371]	[0.363]
Age	-0.833	-0.712	-0.350
	[1.039]	[1.110]	[1.083]
Population	0.704	0.607	0.644
	[0.788]	[0.797]	[0.827]
Import		-1.051	-0.951
		[1.158]	[1.189]
Export		-1.982	-2.212
		[1.596]	[1.590]
Group		0.313	0.464
		[1.350]	[1.220]
Family Firm		-0.303	-0.271
		[1.130]	[1.143]
% Graduated Empl.		0.0392	0.0463
		[0.0327]	[0.0316]
R&D		-1.894	-1.819
		[1.207]	[1.163]
Region FE	✓	✓	✓
Industry (2 Digit) FE	✓	✓	✓
R-squared	0.185	0.197	0.209
N obs.	4886	4886	4886

Notes: $\mathbb{E}_{i,t}(P^g)$ denotes the post COVID-19 expectations for firm-level price over a 12-month horizon. For the definition of the explanatory variables see Table A1. Weighted OLS estimates. Standard error (in square brackets) clustered at the province level. *, **, *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

Table 4: Baseline Model for Continuous Measures for Sales, Orders, Employment, and Investment

	(1) $\mathbb{E}_{i,t}$(Sal^{g}3M)	(2) $\mathbb{E}_{i,t}$(Sal^{g}1Y)	(3) $\mathbb{E}_{i,t}$(Ord^g)	(4) $\mathbb{E}_{i,t}$(Emp^g)	(5) $\mathbb{E}_{i,t}$(Tan^g)	(6) $\mathbb{E}_{i,t}$(Int^g)
Deaths	-1.774***	-1.731***	-1.933***	-1.571**	-1.554	-0.260
	[0.614]	[0.452]	[0.481]	[0.664]	[1.250]	[0.740]
Essential	10.45***	8.900***	6.733***	4.495**	10.41***	8.706***
	[1.768]	[1.586]	[1.742]	[1.741]	[2.838]	[2.325]
Credit constrained	-14.86***	-7.856***	-10.17***	-7.830**	-4.878*	-5.556**
	[3.600]	[2.361]	[2.746]	[3.073]	[2.586]	[2.235]
$\mathbb{E}_{i,t-1}$(Sales^{g}1Y): Very Negative	-10.59*	-15.22***	-13.56**	-14.48***	-21.15***	-15.33**
	[6.347]	[5.376]	[5.651]	[5.251]	[7.716]	[7.350]
$\mathbb{E}_{i,t-1}$(Sales^{g}1Y): Negative	-3.365	-13.15***	-14.44***	-6.536**	-12.49***	-10.32***
	[5.477]	[3.925]	[3.994]	[2.654]	[3.646]	[3.448]
$\mathbb{E}_{i,t-1}$(Sales^{g}1Y): Positive	6.804	0.439	-2.762	-0.756	-7.633**	-3.681
	[4.479]	[2.707]	[2.817]	[2.460]	[2.962]	[2.747]
$\mathbb{E}_{i,t-1}$(Sales^{g}1Y): Very Positive	7.965*	1.571	-1.391	0.544	-3.839	-4.677
	[4.600]	[3.106]	[3.097]	[2.487]	[3.064]	[3.273]
Size	3.007***	2.775***	2.504***	0.887***	1.228*	0.892
	[0.580]	[0.573]	[0.410]	[0.324]	[0.635]	[0.632]
Age	-1.724**	-2.289**	-2.727***	0.245	-0.602	2.199
	[0.861]	[0.937]	[0.971]	[1.355]	[1.033]	[1.411]
Population	-1.108	-0.971	-0.192	-1.431*	-0.876	-1.443
	[1.209]	[1.228]	[1.407]	[0.858]	[1.027]	[0.987]
Import	-3.535*	-1.329	0.0889	-2.042	-2.620	-1.093
	[2.083]	[1.526]	[1.717]	[1.287]	[2.511]	[2.755]
Export	-5.090***	-1.586	-1.596	0.439	-3.165	-2.180
	[1.775]	[1.541]	[2.004]	[1.217]	[2.834]	[2.243]
Group	-0.0153	0.386	-2.613	1.389	1.960	2.374
	[2.616]	[2.616]	[2.408]	[1.405]	[2.248]	[2.143]
Family Firm	-1.734	-2.492*	-1.930	-1.007	-1.759	-0.800
	[1.536]	[1.303]	[1.385]	[1.341]	[2.195]	[2.130]
% Graduated Empl.	0.0446	-0.00703	0.000901	-0.0130	-0.0233	0.0451*
	[0.0306]	[0.0283]	[0.0270]	[0.0333]	[0.0289]	[0.0266]
R&D	-0.0632	-0.201	-3.057*	2.852**	-1.322	2.712
	[1.756]	[1.331]	[1.745]	[1.416]	[2.506]	[1.703]
Region FE	✓	✓	✓	✓	✓	✓
Industry (2 Digit) FE	✓	✓	✓	✓	✓	✓
R-squared	0.317	0.309	0.272	0.262	0.200	0.197
N obs.	5008	5007	5007	5007	5004	5003

Notes: $\mathbb{E}_{i,t}(Y)$ denotes the post COVID-19 expectations for variable Y. Sal3M^g denotes expected sales growth at a three-month horizon, Sal1Y^g denotes expected sales growth at a 12-month horizon. Ord^g, Emp^g, Tan^g, and Int^g denote the 12-month growth rate for orders, employment, investment in tangible assets, and investment in intangible assets. For the definition of the explanatory variables see Table A1. Weighted OLS estimates. Standard error (in square brackets) clustered at the province level. *, **, *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

Table 5: Financial Constraints and firms' expectations and plans: using Firms' Financial Variables

	(1)	(2)	(3)	(4)	(5)	(6)
	$\mathbb{E}_{i,t}(\text{Sal}^g\text{3M})$	$\mathbb{E}_{i,t}(\text{Sal}^g\text{1Y})$	$\mathbb{E}_{i,t}(\text{Ord}^g)$	$\mathbb{E}_{i,t}(\text{Emp}^g)$	$\mathbb{E}_{i,t}(\text{Tan}^g)$	$\mathbb{E}_{i,t}(\text{Int}^g)$
Deaths	-1.623**	-1.469**	-2.080***	-1.800***	-1.266	0.297
	[0.810]	[0.619]	[0.679]	[0.656]	[1.198]	[0.870]
Essential	11.02***	9.137***	6.700***	4.732***	10.84***	8.709***
	[1.587]	[1.648]	[1.862]	[1.598]	[2.938]	[2.521]
Liquidity	8.112***	5.275**	8.010***	5.804**	4.388	4.451*
	[2.370]	[2.329]	[2.468]	[2.901]	[2.962]	[2.473]
Cash Flow	-7.683	0.373	1.673	11.19*	-3.093	-3.710
	[6.728]	[4.740]	[5.358]	[5.982]	[6.989]	[7.455]
Tangible Assets	4.563	7.925**	5.229	-0.113	2.523	-0.384
	[4.930]	[3.369]	[3.889]	[4.547]	[5.502]	[4.472]
Leverage	-0.0747	-0.0592	0.0805*	0.107**	-0.0412	-0.000812
	[0.0647]	[0.0631]	[0.0475]	[0.0526]	[0.0735]	[0.0626]
N of Lender Banks	-3.722	-1.380	-2.209	-2.393	-0.988	1.150
	[2.811]	[2.785]	[2.830]	[2.001]	[3.236]	[2.590]
Lending Relationship (Years)	3.321**	0.796	1.696	1.566	0.284	0.577
	[1.478]	[1.308]	[1.695]	[1.185]	[1.592]	[1.462]
Distance lender bank	-0.162	0.742	-0.396	-0.0489	0.425	0.961
	[0.692]	[0.660]	[0.654]	[0.946]	[0.857]	[0.840]
Trade Credit	-1.688	-5.250	1.852	3.452	0.313	-6.311
	[5.213]	[4.962]	[5.109]	[3.930]	[5.831]	[7.177]
Region FE	✓	✓	✓	✓	✓	✓
Industry (2 Digit) FE	✓	✓	✓	✓	✓	✓
Wide controls	✓	✓	✓	✓	✓	✓
R-squared	0.325	0.320	0.272	0.294	0.200	0.195
N obs.	4709	4708	4708	4708	4705	4704

Notes: For variable definition see Table 4. For the definition of the explanatory variables see Table A1. Weighted OLS estimates. Standard error (in square brackets) clustered at the province level. *, **, *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

Table 6: Determinants of Post COVID-19 Financial Constraints

Dependent Variable:	Credit constrained (Post COVID-19)		
	(1)	(2)	(3)
Deaths	0.0210	0.0206	0.0202
	[0.0182]	[0.0192]	[0.0198]
Essential	-0.0000649	0.00376	0.00881
	[0.0450]	[0.0437]	[0.0408]
Liquidity	-0.433***	-0.353***	-0.303***
	[0.0979]	[0.0890]	[0.0938]
Cash Flow	-0.151***	-0.152***	-0.143***
	[0.0332]	[0.0310]	[0.0290]
Leverage	0.00164*	0.00142	0.00172**
	[0.000916]	[0.000864]	[0.000789]
Trade Credit	-0.213*	-0.200*	-0.245**
	[0.112]	[0.111]	[0.109]
Tangible Assets	-0.0770	-0.0690	-0.0930
	[0.0854]	[0.0881]	[0.0872]
Size	-0.0225	-0.0154	-0.0265
	[0.0153]	[0.0146]	[0.0171]
Age	0.0227	0.0202	0.0221
	[0.0254]	[0.0249]	[0.0228]
Group	-0.0721	-0.0803	-0.0809
	[0.0565]	[0.0526]	[0.0521]
Credit constrained		0.171***	0.198***
		[0.0535]	[0.0562]
N of Lender Banks			0.105*
			[0.0539]
Lending Relationship (Years)			-0.0199
			[0.0275]
Distance with lender bank			0.000422
			[0.0169]
Region FE	✓	✓	✓
Industry (2 Digit) FE	✓	✓	✓
Lender Bank FE	X	X	✓
Wide controls	✓	✓	✓
Pseudo R-squared	0.144	0.170	0.182
N obs.	4693	4693	4613

Notes: The dependent variable is a dummy variable representing whether or not the firm is financially constrained. Logit marginal effects for weighted sample. Standard error (in square brackets) clustered at the province level. *, **, *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

Table 7: Model with Interactions for Expected Sales Growth

Model	OLS		Ordered Logit		
Dependent variable:	$\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y})$	$\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y})$	$\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y})$	$\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y})$	$\Delta^R \mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y})$
	(1)	(2)	(3)	(4)	(5)
Deaths	-0.0587***	-0.0552**	-0.144**	-0.138**	-0.146**
	[0.0219]	[0.0214]	[0.0694]	[0.0703]	[0.0681]
Essential	0.385***	0.374***	1.041***	1.023***	1.050***
	[0.0581]	[0.0617]	[0.163]	[0.175]	[0.170]
Credit constrained	-0.347***	-0.327***	-1.448***	-1.391***	-0.956***
	[0.0922]	[0.0891]	[0.343]	[0.332]	[0.226]
Constrained × Deaths	0.0818	0.0663	0.209	0.154	0.195
	[0.0600]	[0.0556]	[0.211]	[0.211]	[0.177]
Constrained × Essential	0.155	0.153	0.925**	0.906**	0.434
	[0.143]	[0.140]	[0.442]	[0.441]	[0.382]
Region FE	✓	✓	✓	✓	✓
Industry (2 Digit) FE	✓	✓	✓	✓	✓
Wide Controls	X	✓	X	✓	✓
R-squared (Pseudo R2)	0.259	0.272	(0.147)	(0.155)	(0.245)
N obs.	5008	5008	5008	5008	5008

Notes: Weighted OLS and ordered logistic estimates. Standard error (in square brackets) clustered at the province level. *, **, *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

Table 8: Model with Interactions for Expected Price Growth

Dependent variable:	$\mathbb{E}_{i,t}(\mathrm{P}^g)$	$\mathbb{E}_{i,t}(\mathrm{P}^g)$	$\Delta^R\mathbb{E}_{i,t}(\mathrm{P}^g)$
	(1)	(2)	(3)
Deaths	2.701***	2.518***	2.600***
	[0.957]	[0.863]	[0.847]
Essential	-0.980	-1.390	-1.727
	[2.677]	[2.456]	[2.579]
Credit constrained	11.27**	10.37**	9.832*
	[4.662]	[4.861]	[5.297]
Constrained × Deaths	-0.718	-0.109	2.020
	[1.693]	[1.625]	[1.512]
Constrained × Essential	-9.835**	-9.204**	-9.381*
	[4.002]	[4.070]	[4.889]
$\mathbb{E}_{i,t-1}(\mathrm{P}^g)$	0.121	0.138	
	[0.0835]	[0.0893]	
Region FE	✓	✓	✓
Industry (2 Digit) FE	✓	✓	✓
Wide Controls	X	✓	✓
R-squared	0.192	0.202	0.216
N obs.	4886	4886	4886

Notes: Weighted OLS estimates. Standard error (in square brackets) clustered at the province level. *, **, *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

Table 9: Model with Interactions for Continuous Measures for Sales, Orders, Employment, and Investment

	(1)	(2)	(3)	(4)	(5)	(6)
	$\mathbb{E}_{i,t}(\text{Sal}^g 3\text{M})$	$\mathbb{E}_{i,t}(\text{Sal}^g 1\text{Y})$	$\mathbb{E}_{i,t}(\text{Ord}^g)$	$\mathbb{E}_{i,t}(\text{Emp}^g)$	$\mathbb{E}_{i,t}(\text{Tan}^g)$	$\mathbb{E}_{i,t}(\text{Int}^g)$
Deaths	-0.581	-1.744***	-1.765***	-1.448*	-1.727	-0.227
	[0.573]	[0.544]	[0.581]	[0.809]	[1.147]	[0.696]
Essential	9.459***	7.895***	5.815***	5.345***	8.505***	6.908***
	[1.765]	[1.613]	[1.754]	[1.737]	[3.053]	[2.454]
Credit constrained	-10.67*	-12.10***	-12.80**	-3.471	-13.96**	-12.75**
	[5.424]	[4.447]	[4.972]	[3.947]	[6.428]	[5.712]
Constrained × Deaths	-8.954***	0.240	-1.148	-1.056	1.593	0.00685
	[2.987]	[1.981]	[2.268]	[2.850]	[2.761]	[2.292]
Constrained × Essential	5.227	7.092	6.211	-6.153	13.67**	12.60**
	[6.856]	[5.389]	[5.862]	[5.386]	[5.530]	[5.272]
Region FE	✓	✓	✓	✓	✓	✓
Industry (2 Digit) FE	✓	✓	✓	✓	✓	✓
Wide Controls	✓	✓	✓	✓	✓	✓
R-squared	0.333	0.312	0.275	0.265	0.206	0.203
N obs.	5008	5007	5007	5007	5004	5003

Notes: Weighted OLS estimates. Standard error (in square brackets) clustered at the province level. *, **, *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

Table 10: Model with Additional Interactions for Expected Price Growth

Dependent variable:	$\mathbb{E}_{i,t}(\mathrm{P}^g)$	$\mathbb{E}_{i,t}(\mathrm{P}^g)$	$\Delta^R\mathbb{E}_{i,t}(\mathrm{P}^g)$
	(1)	(2)	(3)
Deaths	2.698***	2.514***	2.595***
	[0.963]	[0.870]	[0.853]
Essential	-0.850	-1.288	-1.617
	[2.699]	[2.464]	[2.583]
Credit constrained	-2.085	-3.848	-6.606
	[5.201]	[5.198]	[6.670]
Constrained × Deaths	-1.521	-0.880	1.461
	[1.647]	[1.608]	[1.578]
Constrained × Essential	-10.82**	-9.944**	-9.999*
	[4.209]	[4.383]	[5.429]
Constrained × Concentration	3.483***	3.347***	3.033**
	[0.991]	[1.061]	[1.165]
Constrained × Churning	3.787**	4.080**	4.772**
	[1.714]	[1.821]	[1.957]
$\mathbb{E}_{i,t-1}(\mathrm{P}^g)$	0.122	0.139	
	[0.0824]	[0.0871]	
Region FE	✓	✓	✓
Industry (2 Digit) FE	✓	✓	✓
Wide Controls	✓	✓	✓
R-squared	0.202	0.213	0.226
N obs.	4877	4877	4877

Notes: Weighted OLS estimates. Standard error (in square brackets) clustered at the province level. *, **, *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

A Data Appendix

Table A1: Variable definition and sources

Variable name	Definition
$\mathbb{E}_{i,t-1}(\text{Sales}^g 1\text{Y})$	Pre COVID-19 expected sales growth over the next 12 months (2019 MET survey). Ordinal variable taking values: Very negative (below -15%), Negative (-15%,-5%), Constant [-5%,+5%], Positive (+5%,+15%), Very positive (above 15%).
$\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y})$	Post COVID-19 expected sales growth over the next 12 months (COVID-19 survey). Ordinal variable taking values: Very negative (below -15%), Negative (-15%,-5%), Constant [-5%,+5%], Positive (+5%,+15%), Very positive (above 15%).
$\mathbb{E}_{i,t-1}(\text{P}^g)$	Pre COVID-19 plans on the change in domestic prices over the next 12 months (2019 MET survey). Continuous variable.
$\mathbb{E}_{i,t}(\text{P}^g)$	Post COVID-19 plans on the change in domestic prices over the next 12 months (COVID-19 survey). Continuous variable.
$\mathbb{E}_{i,t}(\text{Sal}^g 3\text{M})$	Post COVID-19 expected change in sales over the next 3 months (COVID-19 survey). Continuous variable.
$\mathbb{E}_{i,t}(\text{Sal}^g 1\text{Y})$	Post COVID-19 expected change in sales over the next 12 months (COVID-19 survey). Continuous variable.
$\mathbb{E}_{i,t}(\text{Ord}^g)$	Post COVID-19 expected change in orders over the next 12 months (COVID-19 survey). Continuous variable.
$\mathbb{E}_{i,t}(\text{Emp}^g)$	Post COVID-19 adjustment plans on employment over the next 12 months (COVID-19 survey). Continuous variable.
$\mathbb{E}_{i,t}(\text{Tan}^g)$	Post COVID-19 adjustment plans on investment in tangibles over the next 12 months (COVID-19 survey). Continuous variable.
$\mathbb{E}_{i,t}(\text{Int}^g)$	Post COVID-19 adjustment plans on investment in tangibles over the next 12 months (COVID-19 survey). Continuous variable.
Credit constrained	Pre COVID-19 binary variable taking value of one if the firm i. did not applied for a bank loan because it would have been denied, ii. applied for a loan and it was denied, or iii. applied for a loan and it was accepted with unfavorable conditions; it takes zero otherwise (2019 MET survey).
Essential	Binary variable taking value of one if the firm i. is deemed to be essential in the 6-digit sectoral classification of of the Italian government's decree for the lockdown or ii. is deemed to be non-essential and declares to have not shut down during the lockdown; it takes zero otherwise. (COVID-19 survey and Italian government's decree of March 22).
No action	Binary variable taking value of one if the firm is not taking and not planning to take any action to face the crisis; it takes zero otherwise (COVID-19 survey).
Teleworking	Binary variable taking value of one if the firm is employing or planning to employ teleworking to face the crisis; it takes zero otherwise (COVID-19 survey).
Employment reduction	Binary variable taking value of one if the firm is reducing or planning to reduce employment to face the crisis; it takes zero otherwise (COVID-19 survey).
Hours reduction	Binary variable taking value of one if the firm is reducing or planning to reduce the amount of hours worked by its employees to face the crisis; it takes zero otherwise (COVID-19 survey).
Total shutdown	Binary variable taking value of one if the firm is shutting down or planning to shut down to face the crisis; it takes zero otherwise (COVID-19 survey).
Partial shutdown	Binary variable taking value of one if the firm is (or planning to) partially shutting down some production lines to face the crisis; it takes zero otherwise (COVID-19 survey).
Wage guarantee funds	Binary variable taking value of one if the firm is applying or planning to apply to wage guarantee funds to face the crisis; it takes zero otherwise (COVID-19 survey).

Variable name	**Definition**
Size	Log of assets (2018 firm balance sheets, Crif-Cribis D&B).
Age	Log of (1+) age of the firm (2019 MET survey).
Cases	Number of reported cumulative COVID-19 cases at the provincial level (https://github.com/pcm-dpc/covid-19)
Deaths	Log of (1+) COVID-19 cumulative deaths at the provincial level (imputed from number of cases, https://github.com/pcm-dpc/covid-19)
Population	Log of population at a provincial level (ISTAT).
Import	Binary variable taking value of one if the firm is an importer; it takes zero otherwise (2019 MET survey).
Export	Binary variable taking value of one if the firm is an exporter; it takes zero otherwise (2019 MET survey).
Group	Binary variable taking value of one if the firm is part of a corporate group; it takes zero otherwise (2019 MET survey).
Family firm	Binary variable taking value of one if the firm is a family business; it takes zero otherwise (2019 MET survey).
% graduated employment	Percentage of graduated employment in the firm, continuous variable (2019 MET survey).
R&D	Binary variable taking value of one if the firm performs activity of Research and Development; it takes zero otherwise (2019 MET survey).
Liquidity	Liquid assets to total assets ratio (2018 firm balance sheets, Crif-Cribis D&B).
Cash flow	Cash flow to total assets ratio (2018 firm balance sheets, Crif-Cribis D&B).
Tangible assets	Tangible assets to total assets ratio (2018 firm balance sheets, Crif-Cribis D&B).
Leverage	Total debt to equity ratio (2018 firm balance sheets, Crif-Cribis D&B).
N. of Lender Banks	Number of banks the firm is borrowing from as of January 2020 (2019 MET survey).
Lending relationship (years)	Duration of the relationship with the lender bank as of January 2020 (2019 MET survey). For firms borrowing from multiple banks (roughly 30% of the sample) this measure is computed as the equally-weighted average across the outstanding relationships.
Distance lender-bank	Distance in log-Km between the firm and the headquarter of the lender bank (2019 MET survey). For firms borrowing from multiple banks (roughly 30% of the sample) this measure is computed as the equally-weighted average across the outstanding relationships.
Trade credit	Net accounts payable (accounts payable net of accounts receivable) to total assets ratio (2018 firm balance sheets, Crif-Cribis D&B).
Credit constrained (post COVID-19)	Binary variable taking value of one if the firm expects credit constraints to be a potential issue after the COVID-19 pandemic; it takes zero otherwise (COVID-19 survey).
Concentration	two-digit sectoral Herfindahl-Hirschman Index (entire population of 2018 Italian balance sheets, Crif-Cribis D&B).
Churning	Number of exiting firms plus number of entering firms over the number of existing firms in 2018 at the two-digit sectoral level (official Italian registry data, Infocamere).

Table A2: Descriptive Statistics

		Raw Sample					Weighted Sample				
Variable	Type	Mean	Q1	Q2	Q3	Stdev	Mean	Q1	Q2	Q3	Stdev
$\mathbb{E}_{i,t}$(Sales^{g}1Y): Very Negative	Categ.	0.440	–	–	–	–	0.489	–	–	–	–
$\mathbb{E}_{i,t}$(Sales^{g}1Y): Negative	Categ.	0.323	–	–	–	–	0.309	–	–	–	–
$\mathbb{E}_{i,t}$(Sales^{g}1Y): Constant	Categ.	0.197	–	–	–	–	0.178	–	–	–	–
$\mathbb{E}_{i,t}$(Sales^{g}1Y): Positive	Categ.	0.025	–	–	–	–	0.016	–	–	–	–
$\mathbb{E}_{i,t}$(Sales^{g}1Y): Very Positive	Categ.	0.008	–	–	–	–	0.006	–	–	–	–
$\mathbb{E}_{i,t-1}$(Sales^{g}1Y): Very Negative	Categ.	0.047	–	–	–	–	0.059	–	–	–	–
$\mathbb{E}_{i,t-1}$(Sales^{g}1Y): Negative	Categ.	0.134	–	–	–	–	0.143	–	–	–	–
$\mathbb{E}_{i,t-1}$(Sales^{g}1Y): Constant	Categ.	0.581	–	–	–	–	0.625	–	–	–	–
$\mathbb{E}_{i,t-1}$(Sales^{g}1Y): Positive	Categ.	0.208	–	–	–	–	0.151	–	–	–	–
$\mathbb{E}_{i,t-1}$(Sales^{g}1Y): Very Positive	Categ.	0.031	–	–	–	–	0.021	–	–	–	–
$\mathbb{E}_{i,t}$(P^g)	Cont.	0.047	0.000	0.000	0.100	0.147	0.071	0.000	0.000	0.100	0.183
$\mathbb{E}_{i,t-1}$(P^g)	Cont.	0.015	0.000	0.000	0.030	0.068	0.011	0.000	0.000	0.010	0.061
$\mathbb{E}_{i,t}$(Sal^{g}3M)	Cont.	-0.226	-0.300	-0.150	0.000	0.265	-0.239	-0.400	-0.150	0.000	0.294
$\mathbb{E}_{i,t}$(Sal^{g}1Y)	Cont.	-0.169	-0.250	-0.100	0.000	0.208	-0.193	-0.300	-0.100	0.000	0.234
$\mathbb{E}_{i,t}$(Ord^g)	Cont.	-0.156	-0.220	-0.100	0.000	0.221	-0.174	-0.300	-0.100	0.000	0.244
$\mathbb{E}_{i,t}$(Emp^g)	Cont.	-0.069	0.000	0.000	0.000	0.191	-0.088	0.000	0.000	0.000	0.236
$\mathbb{E}_{i,t}$(Tan^g)	Cont.	-0.139	-0.100	0.000	0.000	0.307	-0.146	-0.100	0.000	0.000	0.322
$\mathbb{E}_{i,t}$(Int^g)	Cont.	-0.121	-0.060	0.000	0.000	0.293	-0.131	-0.060	0.000	0.000	0.312
Credit constrained	Categ.	0.163	–	–	–	–	0.178	–	–	–	–
Credit constrained (post)	Categ.	0.354	–	–	–	–	0.372	–	–	–	–
Deaths	Cont.	4.143	3.018	4.114	5.046	1.552	4.207	3.077	4.162	5.046	1.639
Cases	Cont.	6.687	5.793	6.729	7.488	1.291	6.732	5.823	6.738	7.525	1.361
Population	Cont.	13.39	12.79	13.35	13.92	1.190	13.62	12.94	13.69	14.63	1.232
Essential	Categ.	0.595	–	–	–	–	0.540	–	–	–	–
Size	Cont.	14.73	13.54	14.61	15.78	1.745	13.55	12.32	13.43	14.56	1.672
Age	Cont.	3.010	2.639	3.178	3.555	0.823	2.936	2.565	3.044	3.466	0.778
Export	Categ.	0.299	–	–	–	–	0.146	–	–	–	–
Import	Categ.	0.246	–	–	–	–	0.119	–	–	–	–
R&D	Categ.	0.241	–	–	–	–	0.154	–	–	–	–
Group	Categ.	0.125	–	–	–	–	0.068	–	–	–	–
% graduated empl.	Cont.	0.112	0.000	0.000	0.117	0.220	0.154	0.000	0.000	0.083	0.315
Family firm	Categ.	0.707	–	–	–	–	0.769	–	–	–	–
Leverage	Cont.	0.667	0.506	0.704	0.855	0.234	0.643	0.446	0.675	0.866	0.262
Liquidity	Cont.	0.127	0.014	0.066	0.183	0.158	0.154	0.009	0.072	0.213	0.205
Tangible ass.	Cont.	0.211	0.037	0.143	0.329	0.207	0.197	0.014	0.079	0.313	0.241
Trade credit	Cont.	-0.111	-0.222	-0.048	0.000	0.147	-0.087	-0.149	0.000	0.000	0.141
N banks	Cont.	1.008	0.693	1.098	1.386	0.468	0.833	0.693	0.693	1.098	0.355
Length bank rel.	Cont.	0.597	0.251	0.470	0.775	0.535	0.484	0.251	0.415	0.604	0.479
Distance bank	Cont.	5.424	5.024	5.669	6.236	1.218	5.248	4.787	5.606	6.276	1.456

B Other Results

Table B1: Composition of the 2019-wave MET and COVID-19 surveys.

	COVID-19 survey (1)	Met-2019 (2)
Macro Industry		
Manufacturing	63.2%	66.7%
Services	36.8%	33.3%
Size Class		
1-9 Employees	51.1%	48.1%
10-49 Employees	33.0%	34.8%
50-249 Employees	12.8%	12.5%
250 and more Employees	3.20%	4.60%
Macro Region		
Nort-West	25.1%	24.8%
Nort-East	26.6%	24.8%
Center	24.1%	25.4%
South	24.2%	25.0%

Notes: Share of firms in the sample by macro-industry, size class, and macro-geographical region. Column 1 shows the composition of the COVID-19 survey while Column 2 reports the composition of the original 2019 MET survey.

Table B2: Validation for expected sales growth

Dependent Variable:	Realized sales growth (categorical)					
	Panel A: full sample 2008–2019					
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{E}_{i,t-1}(\text{Sales}^g 1\text{Y})$: Very Negative		-7.102***		-6.495***		-2.678***
		[0.0877]		[0.131]		[0.0375]
$\mathbb{E}_{i,t-1}(\text{Sales}^g 1\text{Y})$: Negative		-2.240***		-1.572***		-1.059***
		[0.0569]		[0.0820]		[0.0216]
$\mathbb{E}_{i,t-1}(\text{Sales}^g 1\text{Y})$: Positive		2.569***		1.986***		1.344***
		[0.0436]		[0.0639]		[0.0170]
$\mathbb{E}_{i,t-1}(\text{Sales}^g 1\text{Y})$: Very Positive		7.028***		5.537***		3.038***
		[0.110]		[0.167]		[0.0470]
Time FE	✓	✓	✓	✓	✓	✓
Province FE	✓	✓	X	X	✓	✓
Industry (2 Digit) FE	✓	✓	X	X	✓	✓
Firm FE	X	X	✓	✓	X	X
Estimator	OLS		Within		Ordered Logit	
R-squared (Pseudo R2)	0.039	0.210	0.034	0.140	(0.017)	(0.105)
N obs.	91540	91540	91540	91540	91540	91540
	Panel B: sovereign-debt crisis only (2011)					
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{E}_{i,t-1}(\text{Sales1Y})$: Very Negative		-10.56***		–		-4.457***
		[0.164]		–		[0.0985]
$\mathbb{E}_{i,t-1}(\text{Sales1Y})$: Negative		-2.009***		–		-1.240***
		[0.128]		–		[0.0602]
$\mathbb{E}_{i,t-1}(\text{Sales1Y})$: Positive		2.698***		–		1.735***
		[0.110]		–		[0.0542]
$\mathbb{E}_{i,t-1}(\text{Sales1Y})$: Very Positive		5.590***		–		3.331***
		[0.404]		–		[0.231]
Province FE	✓	✓	X	X	✓	✓
Industry (2 Digit) FE	✓	✓	X	X	✓	✓
Estimator	OLS		–		Ordered Logit	
R-squared (Pseudo R2)	0.012	0.345	–	–	(0.005)	(0.155)
N obs.	14760	14760	–	–	14760	14760

Notes: the dependent variable is the realized categorical growth rate of sales. The explanatory variable is the expectations of future sales growth at the one-year horizon formed the previous period ($\mathbb{E}_{i,t-1}(\text{Sales}^g 1\text{Y})$). Both variables are categorical and take a value from one to five if the firm reported expected or realized sales growth to be: i. very negative (less than -15%); ii. negative (between -15% and -5%); iii. stable (between -5% and +5%); iv. positive (between 5% and 15%); and v. very positive (more than 15%). The estimator varies across columns: weighted OLS in columns 1 and 2, within estimator with firm and time fixed effects in columns 3 and 4, and weighted ordered logit (estimates) in columns 5 and 6. Standard errors (in square brackets) clustered at the province level. *, **, *** indicate statistical significance at the 10%, 5%, and 1%, respectively. In panel A we report the results for the entire sample (combination of all the waves of the MET survey), while panel B presents results for the sovereign debt crisis only (expectations formed at the end of 2011 for 2012).

Table B3: Alternative measures of geographical exposure to COVID-19

Dependent variable:				$\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y})$				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln(Covid-19 Deaths)	-0.0489***							
	[0.0162]							
$\ln\left(\frac{\text{Covid-19 Deaths}}{\text{Population}}\right)$		-0.0489***	-0.0447**					
		[0.0162]	[0.0170]					
$\frac{\text{Covid-19 Deaths}}{\text{Population}}$				-0.0222				
				[0.0248]				
ln(Excess Deaths)					0.0143			
					[0.0375]			
$\ln\left(\frac{\text{Excess Deaths}}{\text{Population}}\right)$						0.0143	-0.00533	
						[0.0375]	[0.0304]	
$\frac{\text{Excess Deaths}}{\text{Population}}$								-0.0315
								[0.0242]
ln(Population)	0.0375	-0.0114			0.0218	0.0361		
	[0.0321]	[0.0327]			[0.0348]	[0.0400]		
R-squared	0.213	0.213	0.213	0.209	0.212	0.212	0.211	0.213
N obs.	5008	5008	5008	5008	5105	5105	5105	5105
Dependent variable:				$\mathbb{E}_{i,t}(\text{P}^g)$				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln(Covid-19 Deaths)	2.695***							
	[0.998]							
$\ln\left(\frac{\text{Covid-19 Deaths}}{\text{Population}}\right)$		2.695***	1.401*					
		[0.998]	[0.731]					
$\frac{\text{Covid-19 Deaths}}{\text{Population}}$				0.689				
				[0.463]				
ln(Excess Deaths)					0.444			
					[0.618]			
$\ln\left(\frac{\text{Excess Deaths}}{\text{Population}}\right)$						0.444	-0.154	
						[0.618]	[0.448]	
$\frac{\text{Excess Deaths}}{\text{Population}}$								-0.213
								[0.435]
ln(Population)	0.779	3.474***			0.650	1.095		
	[0.559]	[1.186]			[0.606]	[0.802]		
R-squared	0.173	0.173	0.151	0.139	0.169	0.169	0.167	0.167
N obs.	4991	4991	4991	4991	5088	5088	5088	5088

Notes: Weighted OLS estimates. Standard errors (in square brackets) clustered at the province level. All regressions include narrow controls as well as region and industry (2 Digit) fixed effects. *, **, *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

Table B4: Baseline Sales: multinomial logit

$\mathbb{E}_{i,t}(\text{Sales}^g 1\text{Y})$ Category:	Very Negative	Negative	Constant	Positive	Very Positive
	(1)	(2)	(3)	(4)	(5)
Deaths	0.0239*	-0.00692	-0.0171	0.00146	-0.00133
	[0.0143]	[0.0153]	[0.0115]	[0.00147]	[0.00172]
Essential	-0.206***	0.0880**	0.102***	0.0219***	-0.00640
	[0.0320]	[0.0342]	[0.0279]	[0.00579]	[0.00483]
Credit constrained	0.133**	-0.0784	-0.0525	-0.00575	0.00318
	[0.0551]	[0.0521]	[0.0509]	[0.00427]	[0.00387]
Region FE			✓		
Industry (2 Digit) FE			✓		
Wide controls			✓		
Pseudo R-squared			0.136		
N obs.			5008		

Notes: Multinomial logit (marginal effects) for weighted sample. Standard errors (in square brackets) clustered at the province level. *, **, *** indicate statistical significance at the 10%, 5%, and 1%, respectively.