Policy support during the crisis: So far, so good?

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We use the 2021 vintage of the EIB Investment Survey (EIBIS) which contains a detailed set of questions regarding the nature of the policy support to firms during the Covid-19 crisis. Matched with hard data on the balance sheets and Profit and Loss (P&L) statements of corporations, the survey enables to disentangle the drivers of policy allotment and the impact of the policy support during the investment recovery.

First, we focus on the distribution of the policy support and show that it has been allotted mostly owing to the sales losses during the crisis, going to firms most affected during the crisis. We do not find evidence that the support was tilted towards firms already weak before the crisis.

Second, we show that the firms that have benefitted from the policy support tend to be more optimistic regarding their investment plans. The impact is especially pronounced for investment in digital technologies.

Key Words

EIBIS – Policy support – IV Estimation – Control group – Economic rebound

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1. Introduction

The Covid-19 crisis unfolded very differently from the two recent crises Europe came across, the Great Financial Crisis (GFC) and Sovereign Debt Crisis (SDC). While real GDP slumped more than during the GFC, corporate profits did not decline by as much (EIB, 2021), bank lending spreads did not increase across countries (Altavilla et al, 2020), nor across borrower size (Andersson et al., 2021)[1], investment did not react by as much as during the GFC and the rise in unemployment was contained, thereby limiting the risks of scarring (Portès, 2020). Major disruptions in the European corporate ecosystem were avoided and corporate bankruptcy rates even declined during the crisis.

It is widely acknowledged that this positive outcome mostly resulted from the strength of the policy support deployed, by both monetary, financial and fiscal authorities (Djankov and Zhang, 2021). Monetary and financial supervisory policies have massively contributed to dampening the damaging impact of the crisis. The channels through which they have propagated are more conventional. They have been analysed at length in the literature even before the Covid-19 crisis, be it in the context of the GFC, SDC or the transition towards Basel III strengthened capital requirement.[2]

In this paper, we focus on another layer of policy support. We aim at analysing the nature and impact of the support deployed by the sovereigns and the EU on the corporate ecosystem at the firm level. This component has not benefited from so much attention, so far at least, mostly due to the lack of a homogenous dataset yet available, matching policy support and firm characteristics. In this paper, we use a very rich dataset to analyse the nature of this support in detail. Our empirical analysis is based on firm data drawn from the EIB Investment Survey (EIBIS). We focus on the questions related to the policy support entailed in the 2021 vintage to illustrate the effectiveness of the support implemented in shielding corporates and fostering investment post-Covid-19.

Our analysis is related to the emerging debate on the possible side effects of the policy support. As the policy allotment was mostly unconditional, some concerns have been raised about the misallocation of public funds towards the maintenance of corporates that would otherwise have exited, even in the absence of crisis. If this is the case, misallocation of production factors would be more pronounced after the crisis and would weigh on the long-term prospects (Archarya et al., 2020).

We analyse the factors that can enable firms to recover stronger from the crisis, reaching higher productivity levels. We estimate linear and non-linear probability models to explain the likelihood of getting policy support and its impacts on investment plans, controlling for the

[1] Andersson et al. (2021) show that adverse bank lending supply shocks such as those occurring during the GFC/SDC lower loan volumes and rise size spreads as the tightened loan supply has been more adverse for small corporations with limited market access.

[2] See e.g., Kanngieser et al. (2019) on the macroeconomic impact of banks' capital adjustement, Ferrando et al. (2019) on the Outright Monetary Transactions (OMT) programme, Betz and De Santis (2021) on the Corporate Sector Purchase Programme (CSPP) and Andreeva and García-Posada (2020) on Targeted Longer-Term Refinancing Operations (TLTROs).

changes in demand at the sector level and the changes in the balance sheet structure. We show that the policy support has been allotted mostly owing to the sales losses during the crisis, going to the firms most affected. We do not find evidence that the support was tilted towards firms already weak before the crisis. We also find that the firms that benefitted from the policy support tend to be more optimistic regarding their investment plans. The impact is especially pronounced for investment in digital technologies. In some cases, it is strengthened by the recapitalisation that the policy support has triggered. While it is still very difficult to identify the impact of the policy support on the European economy precisely, we believe our results can answer part of the questions of this debate.

The rest of the paper is organised as follows. Section 2 reviews the main finding of the literature on policy support. Section 3 analyses the determinants of the allotment of the policy support. Section 4 analyses its impact on firms' investment plans. Section 5 provides concluding remarks.

2. An overview of the impact of the policy support measures

To dampen the adverse economic impact of the Covid-19 pandemic, national governments implemented a broad set of measures to support the resilience of firms including public loans, state-backed loans guarantees, debt moratoria, job retention schemes (i.e. short-time work, furlough and wage subsidy schemes), tax and social security deferrals and relief, and (targeted) subsidies and grants. In Europe, the measures primarily aimed at supporting the resilience of firms, e.g. by assuring access to finance (via credit guarantees), temporarily reducing costs (via job retention schemes and tax deferrals) and direct support. Whereas the policy mix differed across countries and sectors, income and profit tax deferrals, loan guarantees and job retention schemes are among the most widely used measures. According to EIBIS 2021, the wide-ranging impact of the pandemic led to a broad coverage resulting in one in two businesses being subject to a measure. Joint use of multiple schemes was more limited, yet non-negligible, e.g. 30% of German firms made use of more than one support measure.[3]

While the support measures implemented in Europe are relatively similar, comparing them across countries is still complicated due to a variety of factors. First, the policy mix and parameters, related to the eligibility criteria, the support size or horizon, differ substantially. Second, the volumes of financial support initially set out in the programmes, the envelopes initially budgeted, differ from the amounts disbursed. Third, the Covid-19 policy support measures coincide with other accommodating policies affecting the corporate sector, e.g. the EU's Next Generation EU (NGEU), the ECB's pandemic emergency purchase programme (PEPP), and national support programmes for households as well as automatic stabilizers.

The analysis of the Covid-19 support measures can build on a vast pre-existing literature of microeconomic impact assessments. The impact of loan guarantee schemes at the firm level has been well documented for normal times. Loan guarantees offered by the US Small Business Administration, for example, have been found to create 3 to 3.5 jobs per USD 1 million of

[3] Cross-country details are detailed in section 3.1.

loans (Brown and Earle, 2017). Similarly, EU evidence attributes loan guarantees with a significant positive impact on firms' size, revenues, employment, investment and survival (Asdrubali and Signore, 2015; Bertoni et al., 2018) and innovation (Bertoni et al., 2019; Brault and Signore, 2019). Martín-García and Morán Santor (2021) moreover find a significant impact of credit guarantees by the regional mutual guarantee institution on firm growth in the Spanish Region of Madrid. Country studies for Italy and the Czech Republic, on the other hand, do not find a significant impact (Dvouletý et al., 2019; D'Ignazio & Menon, 2020). Likewise, past subsidized loan programmes for SMEs have been found to have positive effects on job creation, investment and productivity in Bulgaria (Erhardt, 2017) and Hungary (Horvath & Lang, 2021, Endresz et al., 2015). Finally, firm-level evidence shows that job retention schemes prevent layoffs and safeguard firms´ survival, see e.g. Hoffman and Schneck (2011), Cahuc et al. (2018), Lydon et al. (2019), Kopp and Siegenthaler (2019) and Guipponi and Landais (2020).

Although constrained by data availability limitations, early firm-level evidence is positive on the impact of national Covid-19 policy support measures. A selection of model-based simulation exercises have helped to inform policymakers from early on in the pandemic, such as Gourinchas et al. (2020, 2021), Lopez-Garcia (2020), Barnes et al. (2021), Blanco et al. (2021), Demmou et al. (2021a,b), Díez et al. (2021), and Ebeke et al. (2021), Maurin and Pal (2020) have highlighted the potential of support measures to reduce liquidity shortfalls, bankruptcies, as well as output and employment losses relative to a no-policy scenario. Nevertheless, the true realized impact can only be gauged as detailed firm records become available.

More than one and a half years into the pandemic ex-post firm-level evidence is emerging.[4] Hadjibeyli et al. (2021), for example, perform a microsimulation exercise using French firm-level data up to December 2020. The simulations show a 12 pp. lower increase in illiquidity and a 5.3 pp. lower increase in insolvencies when accounting for short-time work, direct subsidies and tax reliefs relative to a scenario without such policies.[5] Building on a similar, yet smaller database for 2020, Bureau et al. (2021) simulate a reduction from 60% to 47% in the share of firms facing a negative cash flow shock as a result of the French support measures (not including loan guarantees). France Stratégie (2021) extend the simulations to data up to March 2021, showing that the support measures (including loan guarantees) reduced the simulated share of firms facing a drop of the gross operating surplus of more than 25 value-added points by 13 pp. Alternatively, Drabancz et al. (2021) employ firm records up to December 2020 to provide causal evidence for Hungary's subsidized loan programmes, showing a 4% higher headcount in firms with five or more employees that received support. Lalinsky and Pal (2021) use firm-level data from Slovakia for March-June 2020 to investigate government wage subsidies. They find significant drops in firms' probability of illiquidity (3.5%) and insolvency

[4] In parallel to the evidence on European support measures, a vast literature assessing the US' loan guarantees under the Paycheck Protection Program (PPP) has emerged. Autor et al. (2020), Hubbard and Strain (2020), Granja et al. (2020), Doniger and Kay (2021) and Faulkender et al. (2021) all finding mild to strong evidence for the PPP boosting employment during the pandemic. Lopez and Speigel (2021) moreover find a marked positive effect of the program on small businesses' growth. Kapinos (2021a,b), nonetheless, draws a more heterogeneous picture of the program's impact.

[5] The strong findings for liquidity are in line with corporate survey results showing that government fiscal support measures were effective in easing the liquidity needs of firms (De Santis et al., 2021).

(3.5%) when granted support. Both studies moreover find stronger effects for smaller firms. In turn, this paper uses firm-level data for the EU, US and UK to gauge the impact of policy support on corporates' investment outlook.

In addition to the firm-level impact, public guarantee schemes are likely to have spurred bank lending. Casanova et al. (2021) present suggestive evidence that the aggregate bank lending to the private non-financial sector grew faster in countries with larger public guarantee schemes. Bank lending moreover was dependent on bank size and the condition of banks' IT systems (Core and De Marco, 2021), with larger and/or better IT equipped banks disbursing guaranteed loans faster. The importance of pre-existing lending relationships, as established for pre-crisis lending (Degryse and Ongena, 2005), was also confirmed for the lending operations during the Covid-19 pandemic.

The positive short-run impact of the policy support measures does not preclude medium-term risks for the sovereigns. While the pandemic-related loan guarantees have the benefit of spreading the exposure, the guarantees issued in response to Covid-19 tend to be concentrated among the most vulnerable firms and the hardest-hit sectors. For example, recent firm-level evidence from Italy finds that financially fragile firms – in particular smaller, less liquid, more leveraged firms and/or firms classified as zombies – are more likely to have received public guaranteed loans during Covid-19 (Core and De Marco, 2021). Interestingly, firm-level evidence for four other EU countries (Croatia, Finland, Slovakia and Slovenia) suggest that this does not hold for employment subsidies and direct subsidies and supports have been distributed towards medium productive firms, and only marginally towards 'zombies'. (Bighelli et al., 2021). Moreover, an initial assessment of bank lending in Austria suggests that increased lending has contributed to the stabilization by providing liquidity for the economy at no additional risks (Kaniovski et al., 2021). Finally, the results of our EU-wide analysis confirm that the lion´s share of firms benefitting from support were in good pre-Covid financial health.

In sum, national Covid-19 policy support measures have played an important role in stabilizing the economy and bank lending during the Covid-19 pandemic. Preliminary firm-level evidence show a decisive role for the support measures in limiting insolvencies and safeguarding employment. The public support schemes that were introduced in response to the Covid-19 pandemic – in particular state-backed loan guarantees –, however, also constitute sizeable contingent liabilities for governments, therefore raising concerns about the potential medium-term risks for sovereigns.

In the two next sections, we rely on the 6th vintage of the European Investment Bank Investment Survey, the EIBIS2021. The annual survey contains information on more than 12000 non-financial firms in the EU.[6] The sampling is representative at the country and sector level for the four sectors considered, manufacturing, services, construction and infrastructure (see Brutscher et al. 2020 for details). The 6th vintage contains several questions related to policy support. We match the answer of the firms with various pre-Covid-19 balance sheets and P&L characteristics to analyse the allotment of the policy support in Section 3. The survey also

[6] EIBIS also surveys close to 1000 firms in the US and UK. Those are not used in this analysis.

contains information about investment plans, their volume as well as their nature, therefore, enabling the analyse of the policy support in Section 4.

3. Allotment of the policy support

In this section, we focus on the nature of the policy support deployed across European economies and investigate its targeted nature using the information collected during the 6th vintage of the EIBIS.

It is important to note upfront that EIBIS2021 survey information does not enable to distinguish whether the absence of policy support reflects a voluntary choice or non–eligibility.[7] Indeed, the recourse to policy support needs both and it is likely that the choice not to apply is indicative of certain firm characteristics or strategies. For example, France Stratégie (2021b) shows that the intensity of recourse decreases with business size, that the recourse to several measures is not systematic, and the non-use appears to be largely voluntary. Besides the eligibility to participate in the programmes, technical factors also matter for their deployment. The operational design of the programmes, the setup of the administrative processes have been used to explain the low take-up rate at the beginning of the crisis. Two key bank characteristics facilitated loan disbursement: size and information technology. Core and de Marco (2021) show that these factors were important because of the high volume of online applications and low-interest margins on guaranteed lending. Pre-existing relationships mattered for the allocation of guaranteed credit, as banks lent more in their core markets and where they have a larger local market share.

In the following, we focus on the effective policy support.

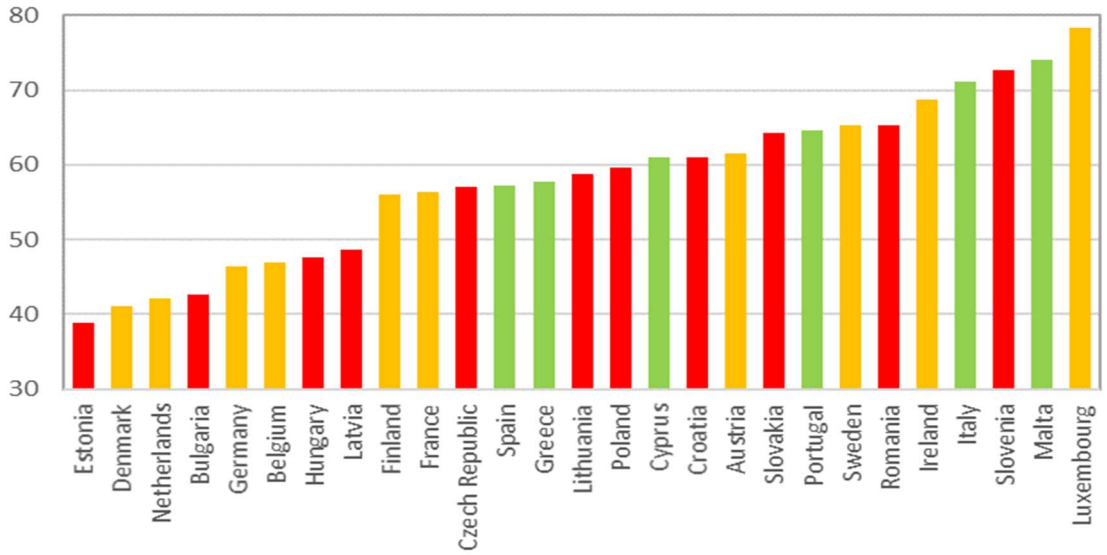
3.1. Nature and intensity of the policy support deployed in EU economies

In the EIBIS, four types of support are considered: (1) New subsidized or guaranteed credits (e.g. loan, overdraft or credit card from a bank or other finance provider) that will need to be paid back in the future but may have preferential or reduced interest rates and/or an extended repayment plan (2) Deferral of payments which still leave a liability to be paid by the company in the future (e.g. deferral of tax payments, deferral of rent or mortgage for commercial property, suspension of interest payments), (3) subsidies or any other type of financial support that the company will not have to pay back in the future, a type of support that comprises job retention policies and (4) any other type of financial support.

Figure 1 reports the share of companies that have benefitted from policy support across the EU. 44% of EU corporates did not get support, a ratio varying from 22% in Luxembourg to 61% in Estonia. This ratio is somewhat lower in Southern economies.

[7] Such information is available in the Add-on module, albeit for a more limited number of companies, around 1000.

Figure 1 Intensity of the policy support across European economies *(% of recipient firm)*



***Source**: Calculations based on the EIBIS 2021. **Note**: % of firm having benefitted from at least one type of support. The colour reflects the region in which the economy is located: Red indicates Central and Eastern economies, Green indicates Southern economies and Orange indicates Northern and Western economies.*

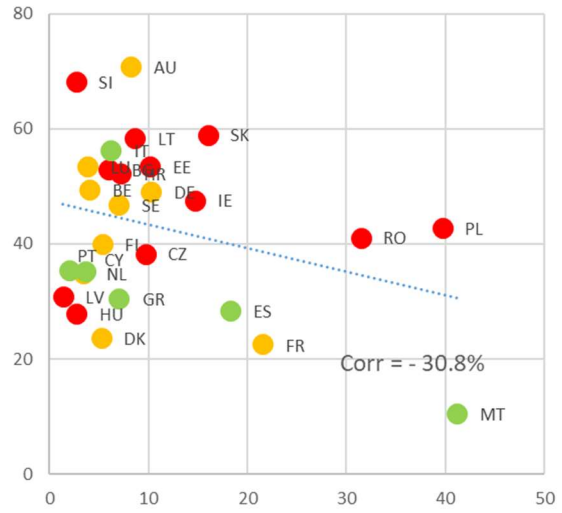
Overall, in Europe, 56% of firms got support via at least one specific policy. The majority of the firms received only one type of support. Around a third of companies that received support benefitted from two types of policies. This represents 12% of firms at the EU level. 4% of firms benefitted from three types of support. Among types of policy support, subsidized financial support (type 3) is the most common, used by 36% of the firms. The ratio was even higher in the Northern and Western economies and in the Central and Eastern economies. A similar share of firms, 16-17%, benefitted from the deferral of payments or credit support to be paid back benefitted.[8]

Turning the different layers of policy support, Figure 2 plots the share of corporations benefitting from two types of support by country. In the left panel, the intensity of new subsidized or guaranteed credits (type 1) is correlated to that of subsidies or any other type of financial support (type 3). The negative relationship suggests that these two types of policies have been substitutes to one another: countries where firms benefit more from subsidies or any other type of financial support are countries where firms benefit less from new subsidized or guaranteed credits. The negative correlation amounts to -31%. In the panel on the right, deferral of payments (type 2) is correlated with subsidies or any other type of financial support not to be paid back (type 3). With a correlation of 30%, the allotment of both policies is positively linked; countries where firms benefit more from one policy also tend to benefit more from the other. This suggests that most of the measures that fall under the category subsidies or any other type of financial support (type 3) are likely to be labour support policies. The allotment of this support has been associated with the deferral of social contributions or tax payments.

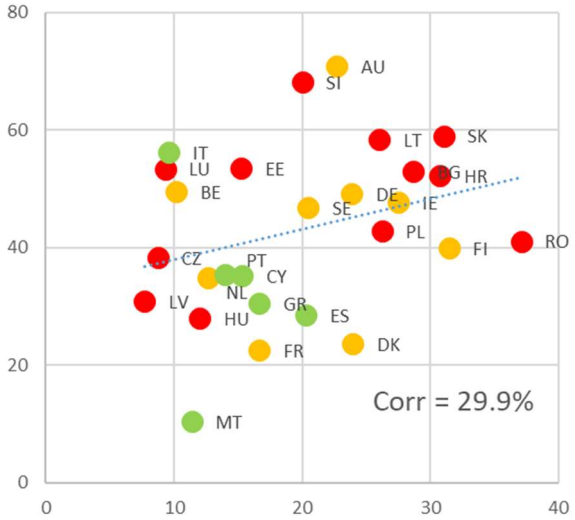
[8] Type 4, "any other type of support", is reported by a small share of companies and is very heterogeneous across countries. Therefore, it is not considered in isolation in this paper.

Figure 2 Relation between types of policy support

New subsidized or guaranteed credits (x-axis) and subsidized or any other type of financial support (y-axis)



Deferral of payments (x-axis) and Subsidized or any other type of financial support (y-axis)



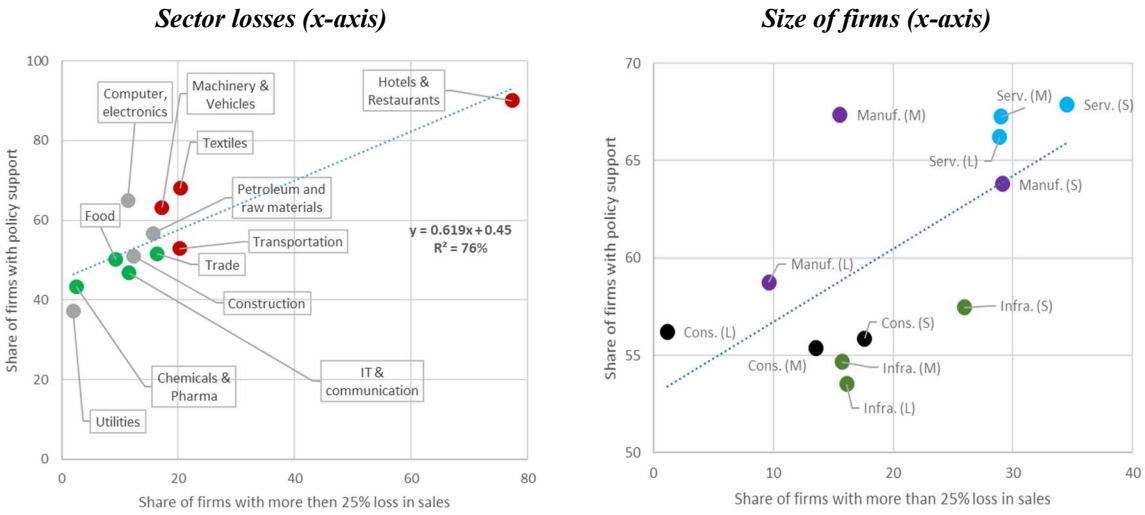
***Source**: Calculations based on the EIBIS 2021. **Note:** See note Figure 1 for an explanation of the colours.*

3.2. The support went to the firms most affected by the crisis

Figure 3 considers sector asymmetries using two different breakdowns. First, in the left panel, we look at the share of firms with policy support against the share of firms with severe sales loss, more than 25% for 12 broad sectors.[9] The panel confirms that services comprise some of the sectors most hit, such as hotel and restaurant, and some not or positively affected, such as IT and telecommunications. The positive correlation with the prevalence of policy support suggests that, across sectors, the support was much linked to the change in activity: the stronger the decline in turnover in the sector, the higher the intensity of the policy support. With an R-square of 76%, there is a strong relationship. When types of policy supports are investigated separately, financial subsidies (type 3) shows the strongest relationship with losses. This again relates to the composition of this policy component temporary unemployment directly linked to activity.

[9] While the EIBIS sampling is not designed to be representative of this twelve sectors, each sector is populated by 350 firms at least. In fact, the four sectors decomposition entailed in the EIBIS provides only an aggregated view on the impact of the crisis.

Figure 3 Determinant of the allotment of policy support (*% of firms*)



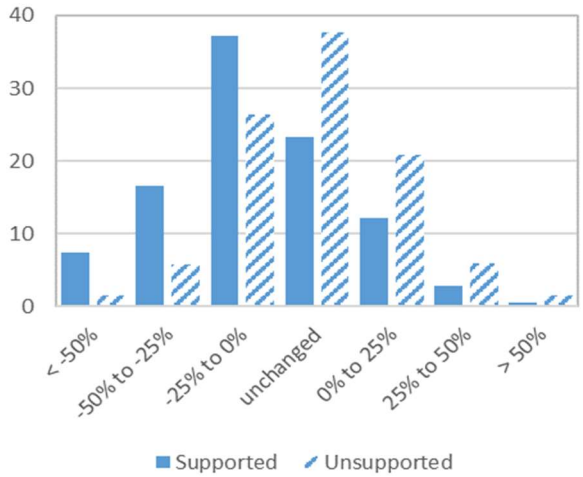
Source: *Calculations based on EIBIS 2021.* ***Note****: Any type of policy support is considered simultaneously.*

Looking at the right-hand panel of Figure 3, we use the breakdown of four sectors together with a breakdown by firm size categories. Firms in the manufacturing and services sector are positioned in the right, implying that they have been more affected. In the same sector, smaller firms were more affected and therefore more likely to get supported. For each of the four sectors considered separately, the proportion of allotment to smaller companies is higher than for larger companies. This seems to reflect the fact, as discussed above, that the smaller firms have reported higher sales losses (Gourinchas et al., 2021). Smaller firms are positioned to the right of their larger counterparts. During the Covid-19 crisis, small firms were more likely to have suffered large sales losses (above 25%) compared to large firms, respectively 29.1% vs 9.1% in the manufacturing sector, 34.5% vs 28.9% in the services sector, 17.6% vs 1.2% in the construction sector and 25.9% vs 16.1% in the infrastructure sector. The difference across sizes is larger in the construction and manufacturing sectors.

Overall, the support went mainly to firms reporting larger sales drops. Figure 4 reports the distribution of the change in sales for firms that got the support and those that did not. The two distributions are different. Firms that got support have a distribution tilted to the left. For the support, the mode of the distribution corresponds to a decline between 0 and 25% while the unsupported have a mode around 0. Hence, supported companies have reported higher declines in sales.

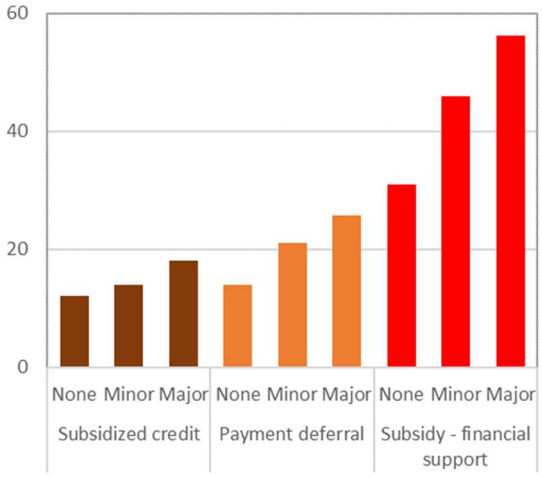
In Figure 5, we report the share of companies that got each type of support, separately for the three policies. Again, the larger the sales loss, the higher the intensity of the support has been. The difference is especially strong for the allotment of subsidies and financial support as in this case, the difference between zero and major sales loss reaches 30%. This is consistent with the nature of this policy support, mostly comprising labour support policies, and therefore even more tied to demand. Conversely, subsidized or guaranteed credits tend to be less targeted. This could suggest that corporates took the opportunity of cheap credit availability to insure themselves against possible liquidity shortfalls.

Figure 4 Distribution of change in sales and policy allotment *(% respondent)*



Source: *Calculations based on EIBIS 2021.* ***Note****: The y-axis indicate the share of firms reporting a change in sales indicated on the x-axis.*

Figure 5 Policy allotment conditioned on sales losses



Source: *Calculations based on the EIBIS 2021.* ***Note****: The y-axis indicate the proportion of firms having benefitted from the support. Minor (Major) change corresponds to less (more) than 25%.*

To better estimate the dependence of the policy allotment on the change in sales during the Covid-19 crisis, we propose the following linear probability model:

$$q^{k}_{i,c,s} = \alpha Sales_i + \theta_c + \theta_{sec} + \theta_{size} + \varepsilon_i \qquad \text{EQ. 1}$$

where q is the answer to the question on the policy support in the EIBIS. It is a dummy variable indicating whether the firm got the policy support. Since several types of policy support are considered, the dummy is indexed by k, the type of support that can be of three types. The variable "Sales" is the change in sales indicated by the answer in the survey. θ are dummy variables controlling for the country (θ_c), the sector (θ_{sec}) and the size (θ_{size}). Consistently with the right-hand panel of **Figure 3**, the four EIBIS sectors are considered in the regression, since those are by construction covered representatively. Again, consistently with **Figure 3**, the three size groups, micro and small, medium and large are considered. The results are presented in **Table 1** and **Figure 6**.

Table 1 Factors explaining the likelihood of getting policy support

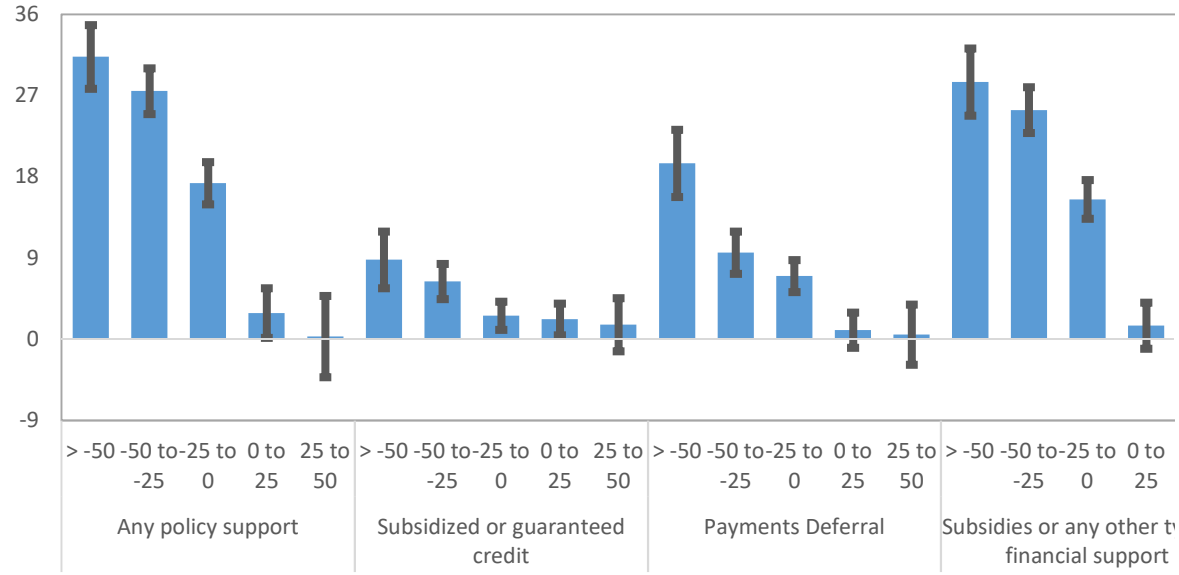
	Any policy support		Subsidized or guaranteed credit	Payments Deferral	Subsidies or any other type of financial support
Sales Loss dummy	**0.214*** **				
	[0.010]				
Sales change					
< -50%		**0.313*** **	**0.088*** **	**0.195*** **	**0.285*** **
		[0.018]	[0.016]	[0.019]	[0.019]
-50% to -25%		**0.275*** **	**0.064*** **	**0.096*** **	**0.254*** **
		[0.013]	[0.010]	[0.012]	[0.013]
-25% to 0%		**0.173*** **	**0.026*** **	**0.070*** **	**0.155*** **
		[0.012]	[0.008]	[0.009]	[0.011]
0% to 25%		**0.029** **	**0.022** **	-0.010	0.015
		[0.014]	[0.009]	[0.010]	[0.013]
25% to 50%		**0.003**	0.016	0.007	-0.001
		[0.023]	[0.015]	[0.017]	[0.021]
> 50%		0.058	0.014	0.024	0.084
		[0.041]	[0.028]	[0.033]	[0.40]
Observations	11,492	11,341	11,341	11,341	11,341
R-squared	0.146	0.154	0.151	0.089	0.183
Country FE	Yes	Yes	Yes	Yes	Yes
Sector FE	yes	yes	yes	yes	yes

Source: *Authors' estimations based on EIBIS21.* ***Note:*** *Linear Probability Model estimated with firm size dummies, sectors and firm age dummy. Constant not reported. Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1. The coefficients reported in bold are significant at 10% or below.*

In Table 1, the first two columns relate to any type of policy support while columns 3 to 5 analyse separately each policy layer. In the first estimation, the likelihood of getting policy support of any type is explained by the dummy reporting of whether firms have recorded sales losses or not. The coefficient is positive and highly significant. It shows that recording a decline in sales increases the probability to be supported by 21 pp. The equations reported in columns 2 to 5 consider a finer breakdown of sale losses, by brackets of 25%. The conclusions drawn from Figure 4 and Figure 5 are confirmed. The impact of sales loss is always significant, for any type of support, considered together or separately. Furthermore, it decreases in intensity with the magnitude of the decline. The higher the loss, the more likely it is that the firm will get support. This is true for the policies in general. However, it is more pronounced for subsidies and other policy support, a component that includes labour support more linked to sales drops. Conversely, this is less conducive for subsidized and guaranteed loans.

Figure 6 reports the coefficients attached to each decline. Focussing on the comparison of policy support measures, the impact of sales losses on the probability of getting the support is more linked to the magnitude of the loss for subsidies and other types of support. Clearly, the higher the losses the stronger the likelihood of getting the support. It should be stressed that this result is obtained after controlling for sector and country fixed effects. This policy appears to be linked to the actual change in the activity mostly. Conversely, the intensity of the change in sales is less determinant for subsidized or guaranteed loans.

Figure 6 Impact of sales loss on the likelihood of getting the policy support across firm characteristics pre-crisis *(Elasticity, change in the probability, pp.)*



Source: *Authors' estimations based on EIBIS 2021 and ORBIS.* ***Note:*** *the plan bar indicates the coefficient estimated in Table 1. The vertical line indicates its 95% confidence interval. The x-axis indicates the change in sales reported by the company.*

3.3. The allotment is mostly unrelated to pre-crisis weakness

We now turn our focus to the discriminatory power of firm-specific characteristics in getting policy support. In particular, we estimate the probability of companies getting the support depending on their status before the crisis. After taking into consideration the impact of sales loss, we investigate the other factors likely to influence policy allotment. We consider factors related to the firm characteristics, its activity, its balance sheet structure or profit and loss accounts. For this, we estimate a logistic regression, EQ2. Separate models are estimated for each pre-crisis firm characteristic, each controlling for the country, sector, size, and sales decline.

$$q_{i,c,s}^{k} = Probit(\alpha Sales_i + characteristic + \theta_c + \theta_s) + \varepsilon_i \qquad \text{EQ2}$$

q is the answer to the question on the policy support in the survey. EQ2 differs from EQ1 in two ways. First, the model is now a logistic model. Second, the change in sales is not the main factor of interest in the equation anymore. They are included but not reported as we are more interested in the role of firm characteristics, considered separately as dummy variables.

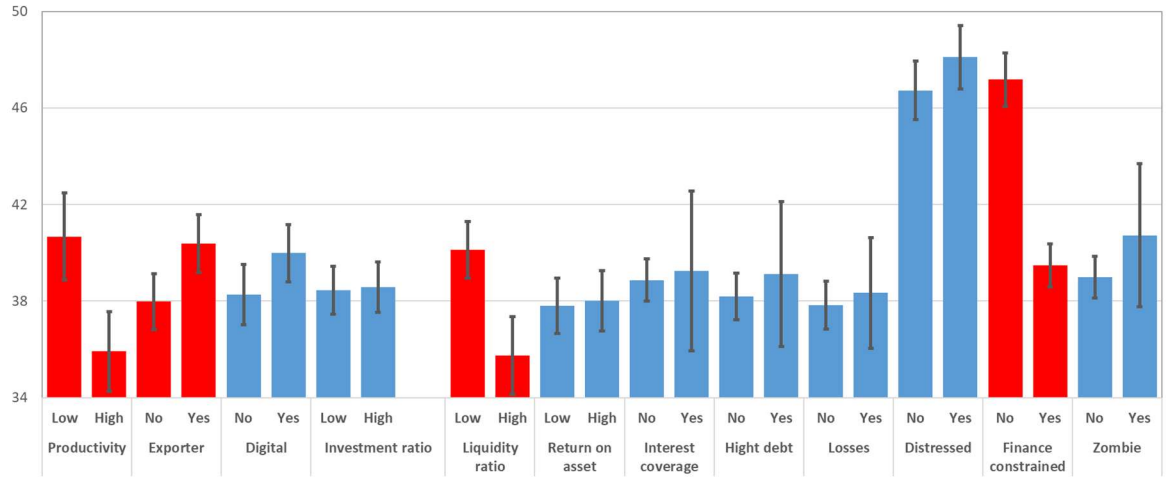
We first estimate the impact of real characteristics: productivity (measured as value-added per employee), investment ratio (measured as the annual growth rate in fixed assets), being digital (implementing at least one type of digital technology), and being an exporter. We then analyse the impact of the following balance sheet structure and profitability indicators: liquidity ratio (cash and equivalent over total assets), return on assets, interest coverage ratio, indebtedness (first and last decile of the financial leverage), loss in the year before the crisis, finance

constrained and zombie status (an interest rate coverage below one for a company of more than ten years).

To report the results of EQ2, Figure 7 plots the change in the predicted probability of getting the policy support (of any type). When the characteristic is binary, the presence or absence is reported as yes or no. When it is continuous, high relates to being in the last decile and low in the first decile. For each factor, a bar is plotted when it is and another bar when it is not.

Beyond the control variables, few factors appear to matter. Above all, the firm's productivity level appears as the main discriminant factor. Firms with low pre-Covid19 productivity are significantly more likely to get policy support than firms with high-level productivity. Being an exporter also significantly matters, albeit to a lesser extent. The other real characteristics do not seem to have a predictive impact.

Figure 7 Predicted probability of getting the policy support across firm characteristics pre-Covid *(% respondent)*



Source: *Authors' estimations based on the EIBIS2021 matched with the ORBIS database.* ***Note:*** *The vertical line reports the 95% interval confidence of the conditional probability of getting the support (see EQ2). Two overlapping lines indicate that the factor does not alter significantly the probability. Red bars indicate when the characteristic is statistically discriminant.*

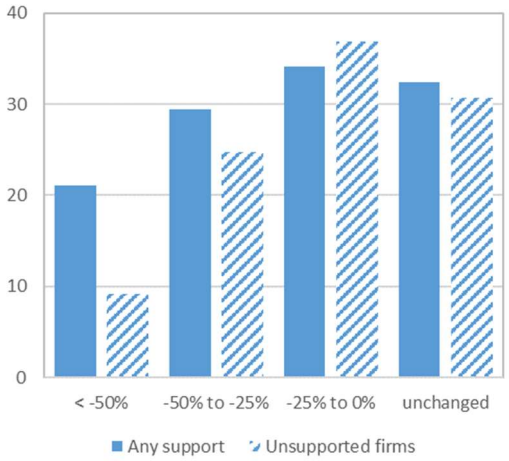
Turning to the financial indicators, only two matter: financially constrained firms, as well as firms with low liquidity, are more likely to get policy support. While firms in distress, firms with low return on assets, firms recording losses, firms highly indebted are more likely to get support, the difference is not significant. Conversely, firms with a lower liquidity ratio, with fewer cash buffers, are significantly more likely to get the policy support. This result suggests that the primary goal of the policy support, avoiding a liquidity dry-out and freezing the corporate ecosystem, was reached. Overall, we do not find evidence for Europe that the support

was tilted towards firms already weak before the crisis, such as financially distressed or zombie firms.[10]

4. The policies' effectiveness

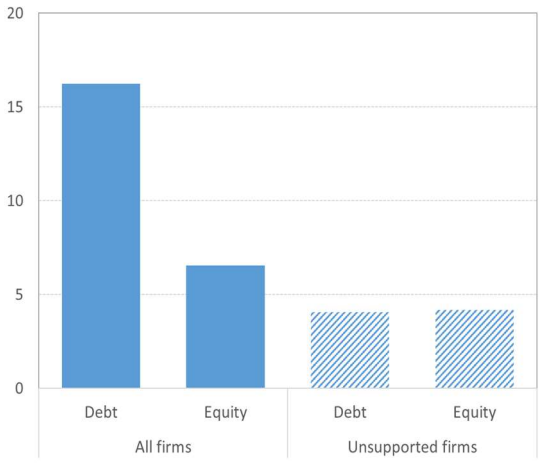
In this section, we analyse the role played by policies in supporting the investment recovery. **Figure 8** plots the percentage of firms planning to invest more in the current financial year depending on the sale loss they have recorded over the Covid-19 period, distinguishing firms that have benefitted from the support and those that have not. The share of firms planning to invest more tend to increase when sales losses become lower. Moreover, comparing across groups of firms, for the same level of losses, those that have been supported plan to raise investment by more. The difference is especially pronounced for large sales losses. **Figure 9** plots the share of firms that have increased their recourse to external finance, debt or equity, depending on whether they have benefitted from policy support. The balance sheet expansion is stronger for those that have been supported. In case of debt, part of the difference reflects the recourse to subsidized loans or guarantees and is therefore accounting the support. This is not the case for equity.

Figure 8 Investment plans conditional on Covid-19 sales losses and policy support *(% respondent)*



Source: *computations based on the EIBIS 2021.* ***Note:*** *the x-axis reflects the sale losses reported by the company. The y-axis reports the percentage of firms surveyed that plan to raise investment in the current financial year.*

Figure 9 Policy support and balance sheet expansion *(% respondent)*



Source: *computations based on the EIBIS 2021.*

4.1. Some evidence that the policy support contributes to the investment rebound

In the EIBIS 2021, several questions are related to investment, either planned or achieved. The question we use in this section relates to the change in financial plans, whether firms revised

[10] Bighelli et al. (2021) reach similar conclusions. The authors show that Covid-19 support was distributed rather efficiently as government subsidies were distributed towards medium productive firms, and only marginally towards the undeserving 'zombies'.

their investment plans due to the Covid-19 pandemic, and if so, in which direction, upwards or downwards. We consider the firms that plan to invest more in the current financial year, i.e. those reported in **Figure 8**.

We aim isolating the channel through which the policy impacts investment while controlling for the characteristics that influence the decision to invest. For this purpose, we estimate the following difference-in-difference equation:

$$q_{i,c,s} = \alpha.Sales_i + \beta.Pol_i^k + \gamma.Sales_i \times Pol_i^k + Z_i + \theta_{sect} + \theta_{size} + \theta_c + \varepsilon_i \quad \text{EQ. 3}$$

As before, q is the dummy variable reflecting the firm's answer to the survey regarding investments. *Sales* is the dummy variable indicating if the firm reported a decline of more than 25% in its sales. *Pol* indicates that the firm has benefitted from at least one policy support measure. Each dummy takes the value one when the answer is positive and zero otherwise. Z is a set of firm characteristics, related to its balance sheet structure or P&L. Labour productivity is always incorporated in the equations, as a standard determinant of investment.[11] It is considered before the Covid-19 crisis to minimise the risk of being impacted by the decline in sales during the crisis. Besides, we alternatively consider the financial leverage, firms in financial distress, and the capital ratio. Financial distress is the dummy variable considered as before while the two other characteristics are taken as continuous variables. Financial leverage is defined as the sum of loans and long-term debt divided by fixed assets. The capital ratio is defined as shareholder's funds over total assets.[12] We expect a positive coefficient, considering that those with a financial leverage has access to external financing in forms of loans are able to invest more than those relying just on their internal sources (no financial leverage). Nevertheless, above a treshhold, financial leverage might indicate debt overhang and in therefore have a negative impact on investment plans. As creditor risk increases with financial distress, this is also expected to have a negative impact. Conversely, for the same reasons, the capital ratio is expected to have a positive impact. As before, the regressions include dummies to account for the sector, θ_{sec}, the size, θ_{size}, and the country effects, θ_c. Standard errors are clustered at the firm level.

Table 2 highlights the result that firms which benefitted from policy support are more likely to increase investment in 2020. First, in all the estimations, the policy allotment has a positive impact. Conversely, recording large sales losses has a negative and always significant impact. The positive coefficient on the interaction effect Sales × Policy indicates that for the same decline in losses, investment prospects are more positive for firms that have benefitted from policy support than for those that have not. This result may suggest that the support has cushioned firms balance sheets and enabled them to rebound stronger. While positive across estimations, the effect is mostly not significant, however. Finally, the firm balance sheet and P&L characteristics do not matter significantly. The coefficient on sales remains relatively constant across estimations, which suggest that the sale shock is relatively orthogonal to firm

[11] Estimations results are not sensitive to the inclusion of productivity in the set of regressors.
[12] All these variables are winsorized to 3% and 97%.

characteristics, consistently with the findings of Section 3. Firms reporting a sales loss of more than 25% are 6 to 9 pp less likely to increase investment.

Table 2 Factors explaining the likelihood of increasing investment in the current financial year

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Policy support	0.014	**0.024****	0.014	0.007	**0.023****	**0.020***	0.010	0.002	0.019
	[0.011]	[0.011]	[0.012]	[0.013]	[0.011]	[0.012]	[0.013]	[0.014]	[0.012]
Covid-year sales loss above 25%		**-0.076*****	**-0.069*****	**-0.057*****	**-0.075*****	**-0.093*****	**-0.086*****	**-0.082*****	**-0.091*****
		[0.013]	[0.014]	[0.016]	[0.013]	[0.022]	[0.024]	[0.029]	[0.022]
Covid-year sales loss above 25% X						0.025	0.025	0.035	0.023
						[0.027]	[0.029]	[0.035]	[0.027]
Pre-covid Productivity	0.004	0.002	-0.001	0.004	0.003	0.002	-0.001	0.004	0.003
	[0.007]	[0.007]	[0.007]	[0.009]	[0.007]	[0.007]	[0.007]	[0.009]	[0.007]
Financial leverage			0.004				0.004		
			[0.006]				[0.006]		
Firm in distress				0.021				0.021	
				[0.017]				[0.017]	
Capital ratio					-0.029				-0.029
					[0.022]				[0.022]
Observations	8,823	8,823	7,796	6,091	8,545	8,823	7,796	6,091	8,545
R-squared	0.018	0.022	0.022	0.019	0.021	0.022	0.022	0.019	0.021
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	yes	yes	yes	yes	yes	yes	yes	yes	yes

Source: *Authors' estimations based on EIBIS21 matched with firm-level ORBIS information.* ***Note:*** *Linear Probability Model estimated with firm size dummies and firm age dummies. Constant not reported. Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1. The coefficients reported in bold are significant at 10% or below.*

4.2. Some evidence that the policy support has enabled financial expansion

We turn to the analysis of the policy support on the liability side of corporate balance sheets. We focus on whether the company has taken any of the following actions as a result of the COVID-19 pandemic: (1) Increased its debt position (2) Raised new equity from current stakeholders or not, or (3) Made changes to its investment plans. We estimate EQ3 for the answers to this question. In particular, we consider firms that have raised equity.[13]

The results are reported in **Table 3**. Across all the estimations, the policy support raises the likelihood of increasing the equity base, an effect always significant at a 1% confidence level. Somewhat surprisingly, sales losses also raise the probability of increasing the equity base. The conjunction of these two effects may suggest that recapitalisation needs resulting from large losses become more likely with the policy allotment. Getting it would increase the probability of crowd-in equity investors. Such interpretation is somewhat supported by the estimated impact of firm characteristics. The higher the financial leverage and the lower the capital ratio

[13] On equity, we consolidate two answers from Q68. Raising new equity (from the market, from external private investors) and raising new equity from current owners. We consider these two possibilities jointly. The question on changes to investment plans is not used as the direction of the change is not specified.

pre-Covid19, the more likely the increase in the equity base. Hence, the change in the financial structure possibly corrects balance sheet weakness.[14]

Table 3 Factors explaining the recapitalisation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Policy support	**0.024*** **	**0.017*** **	**0.015*** **	**0.018*** **	**0.013** **	**0.019*** **	**0.017*** **	**0.019*** **	**0.015*** **
	[0.005]	[0.005]	[0.006]	[0.006]	[0.006]	[0.006]	[0.006]	[0.007]	[0.006]
Covid-year sales loss above 25%		**0.048*** **	**0.045*** **	**0.038*** **	**0.047*** **	**0.055*** **	**0.054*** **	**0.045*** **	**0.055*** **
		[0.008]	[0.009]	[0.010]	[0.008]	[0.014]	[0.015]	[0.017]	[0.015]
Covid-year sales loss above 25%						-0.010	-0.013	-0.009	-0.011
						[0.017]	[0.018]	[0.021]	[0.017]
Pre-covid Productivity	**-0.016*** **	**-0.015*** **	**-0.015*** **	**-0.012** **	**-0.011*** **	**-0.015*** **	**-0.015*** **	**-0.012** **	**-0.011*** **
	[0.004]	[0.004]	[0.004]	[0.005]	[0.004]	[0.004]	[0.004]	[0.005]	[0.004]
Financial leverage			**0.008** **				**0.008** **		
			[0.003]				[0.003]		
Firm in distress				**0.056*** **				**0.056*** **	
				[0.010]				[0.010]	
Capital ratio					**-0.071*** **				**-0.071*** **
					[0.011]				[0.011]
Observations	8,823	8,823	7,796	6,091	8,545	8,823	7,796	6,091	8,545
R-squared	0.032	0.037	0.031	0.049	0.042	0.037	0.031	0.049	0.042
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	yes	yes	yes	yes	yes	yes	yes	yes	yes

Source: *Authors' estimations based on EIBIS21 matched with firm level ORBIS information.* ***Note:*** *Linear Probability Model estimated with firm size dummies and firm age dummy. Constant not reported. The dependent variable is the dummy indicating whether the firm has raised equity. The answer aggregates two possible answers from Q68 in the EIBIS21. Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1. Coefficients reported in bold are significant at 10% or below.*

4.3. Some evidence that the policy support fastens firms digitalisation

In this section we focus on the question that relates to the investment response taken as a response to the Covid-19 pandemic, whether firms have taken any actions or made investments to (1) develop new products, services or processes, (2) transform their supply chain (3) become more digital. We focus on firms that have taken action to become more digital. The crisis has strengthened the case for European firms to digitalise, deeper and faster. Therefore as a last question, we consider the role of the policy support and the strengthening of the equity base in the digital transition. We estimate the following equation with or without the indication on equity injection:

$$q_{i,c,s} = \alpha.Sales_i + \beta.Pol_i^k + \gamma.Sales_i \times Pol_i^k + \emptyset.Equity_i + Z_i + \theta_{sec} + \theta_{size} + \theta_c + \varepsilon_i \quad \text{EQ. 4}$$

Where all the common variables are defined as before, in EQ3, while Equity relates to the question on financial expansion, whether firms have raised equity.

[14] See Maurin and Pal (2020) or Carletti et al. (2020) for the need to increase the capital base of corporates after the sharp fall in profits during the Covid-19 crisis.

Table 4 shows the results explaining the likelihood to increase digitalisation. Interestingly, in all the estimations, sales losses hurt digitalisation, reducing the likelihood to digitalise more by 5 to 9 pp. However, the effect is compensated by the policy allotment. On the one hand, firms that got policy support are unconditionally more likely to digitalise more, by 5 to 6 pp. On the other hand, firms that got the policy support while suffering large sale losses, are more likely to digitalise than those that did suffer sales losses but did not get the policy support, by 4 to 5 pp. Futhermore, digitalisation spending increases with pre-crisis productivity. This result comes after conditioning on the sector and country in which the firms operate. Hence, in the same country and sector, the more productive firms are more likely to digitalise further. This dynamic may contribute to widening the productivity gap as digitalisation is likely to foster productivity. Finally, stronger firms, i.e. those not in distress, having lower leverage or higher capital base, are more likely to digitalise. However, these effects are not significant at 10%.

Table 4 Factors explaining the likelihood of becoming more digital

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
Policy support	**0.055*** **	**0.062*** **	**0.065*** **	**0.062*** **	**0.061*** **	**0.054*** **	**0.057*** **	**0.054*** **	**0.052*** **
	[0.010]	[0.011]	[0.011]	[0.013]	[0.011]	[0.012]	[0.012]	[0.014]	[0.012]
Covid-year sales loss above 25%		**-0.051*** **	**-0.046*** **	**-0.044*** **	**-0.049*** **	**-0.084*** **	**-0.080*** **	**-0.079*** **	**-0.086*** **
		[0.013]	[0.014]	[0.016]	[0.013]	[0.020]	[0.022]	[0.027]	[0.021]
Covid-year sales loss above 25% X						**0.048***	**0.051***	**0.049**	**0.054** **
						[0.025]	[0.027]	[0.032]	[0.026]
Pre-covid Productivity	**0.042*** **	**0.041*** **	**0.037*** **	**0.029*** **	**0.037*** **	**0.041*** **	**0.037*** **	**0.029*** **	**0.037*** **
	[0.007]	[0.007]	[0.007]	[0.008]	[0.007]	[0.007]	[0.007]	[0.008]	[0.007]
Financial leverage			-0.008				-0.008		
			[0.005]				[0.005]		
Firm in distress				-0.021				-0.022	
				[0.016]				[0.016]	
Capital ratio					0.007				0.007
					[0.021]				[0.021]
Observations	8,823	8,823	7,796	6,091	8,545	8,823	7,796	6,091	8,545
R-squared	0.066	0.067	0.073	0.071	0.068	0.068	0.074	0.071	0.068
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	yes	yes	yes	yes	yes	yes	yes	yes	yes

Source: *Authors' estimations based on EIBIS21 matched with firm-level ORBIS information.* ***Note:*** *Linear Probability Model estimated with firm size dummies and firm age dummy. Constant not reported. Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1. The coefficients reported in bold are significant at 10% or below.*

Table 5 shows the results explaining the likelihood of strengthening digitalisation, augmenting the set of variables considered above with variables related to financial expansion, debt as well as equity. As in Table 4, in all the estimations, sales losses has a negative impact on digitalisation, reducing the likelihood to digitalise more by 5 to 10 pp. However, the effect is compensated by the policy allotment. On the one hand, firms that got policy support are unconditionally more likely to digitalise more, by 4 to 5 pp. On the other hand, firms that got the policy support while suffering large sale losses, are more likely to digitalise than those that did suffer sale losses but did not get the policy support, by 5 pp. Also as before, digitalisation spending increases with pre-crisis productivity. Finally, stronger firms, those not in distress, having lower leverage or higher capital base, are more likely to digitalise. Again, these effects are not significant at 10%.

More interestingly, in all the cases, firms that have increased their external financing are more likely to digitalise, an effect that is always significant at 10% at least. Hence, increased equity raises the probability to digitalise by 4 to 5 pp. A similar, but slightly stronger effect is found for debt. When considered jointly with the factors contributing to explain the stronger equity base, this finding suggests that the policy support deployed at the occasion of the crisis could have fostered the crowing-in of investors and thereby speeding up the digital transformation of European firms.

Table 5 Likelihood of becoming more digital

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Policy support	**0.046*** **	**0.053*** **	**0.055*** **	**0.052*** **	**0.052*** **	**0.045*** **	**0.047*** **	**0.045*** **	**0.043*** **
	[0.011]	[0.011]	[0.011]	[0.013]	[0.011]	[0.012]	[0.013]	[0.014]	[0.012]
Covid-year sales loss above 25%		**-0.060*** **	**-0.055*** **	**-0.051*** **	**-0.058*** **	**-0.092*** **	**-0.088*** **	**-0.085*** **	**-0.094*** **
		[0.013]	[0.014]	[0.016]	[0.013]	[0.020]	[0.022]	[0.027]	[0.021]
Covid-year sales loss above 25% X						**0.047***	**0.049***	**0.048**	**0.053** **
						[0.025]	[0.027]	[0.032]	[0.026]
Pre-covid Productivity	**0.043*** **	**0.042*** **	**0.038*** **	**0.031*** **	**0.038*** **	**0.042*** **	**0.038*** **	**0.031*** **	**0.038*** **
	[0.007]	[0.007]	[0.007]	[0.008]	[0.007]	[0.007]	[0.007]	[0.008]	[0.007]
Debt increase	**0.050*** **	**0.058*** **	**0.062*** **	**0.050*** **	**0.060*** **	**0.058*** **	**0.062*** **	**0.050*** **	**0.060*** **
	[0.015]	[0.015]	[0.016]	[0.017]	[0.015]	[0.015]	[0.016]	[0.017]	[0.015]
Equity injection	**0.036***	**0.041** **	**0.048** **	**0.044***	**0.041***	**0.042** **	**0.049** **	**0.044***	**0.042***
	[0.021]	[0.021]	[0.023]	[0.026]	[0.021]	[0.021]	[0.023]	[0.026]	[0.021]
Financial leverage			**-0.010***				**-0.010***		
			[0.005]				[0.005]		
Firm in distress				-0.024				-0.024	
				[0.016]				[0.016]	
Capital ratio					0.018				0.018
					[0.021]				[0.021]
Observations	8,823	8,823	7,796	6,091	8,545	8,823	7,796	6,091	8,545
R-squared	0.067	0.070	0.076	0.072	0.070	0.070	0.076	0.073	0.070
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	yes	yes	yes	yes	yes	yes	yes	yes	yes

Source: *Authors' estimations based on EIBIS21 matched with firm level ORBIS information.* ***Note:*** *Linear Probability Model estimated with firm size dummies and firm age dummy. Constant not reported. Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1. Coefficient reported in bold are significant at 10% or below.*

5. Concluding remarks

In Europe, the policy support deployed during the crisis has been massive and multifaceted. Some have argued that government support is exposed to moral hazard problems: being mostly unconditional, it maintains firms that would have otherwise disappeared without the support triggered by the crisis. According to this argument, the policy deployed could lower the growth prospects of the European economy post-crisis.

Our findings do not support this view. The main explanatory factor to get the policy support was the change in sales during the crisis period and we do not find evidence of zombie lending in the policy allotment as firm weakness indicators do not appear to explain the allotment. We do find that firms with low liquidity buffers got more support and that this difference was significant. But this suggests that the first goal of the policy, avoiding a liquidity dry-out and freezing the corporate ecosystem, was achieved.

Furthermore, we find some evidence that firms that got supported are more positive about their investment outlook. They may have been in a better position to crowd-in investors and recapitalise. Finally, we find evidence that the conjunction of policy support and stronger equity base accelerates the digital transformation of European corporates, a transformation that the crisis has made even more necessary.

Taken together, our findings suggest several measures that policy makers might implement as a second step for a smoother economic recovery and transition to the new normal. After avoiding the liquidity crunch during the temporary halt of the economic activity in 2020, there is a clear need for new policy tools to support corporate solvency. The equity-type instruments are needed as a second step for rebalancing the balance sheet structure of corporates, affected by both strong losses and increasing indebtedness resulted also from successful liquidity support. Moreover, higher long-term growth can be achieved with common public-private efforts in direction of adopting new digital solutions. While corporates are increasingly in favour of digital investments in a post-pandemic world, technological readiness in terms of digital infrastructure and skills are crucial, also to avoid widening cross-regional gaps. Targeted grants might also accelerate digital investments on the firm level.

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