

COVID-19 financial aid and productivity: has support been well spent?

Carlo Altomonte, Maria Demertzis, Lionel Fontagné
and Steffen Müller

Executive summary

CARLO ALTOMONTE (carlo.altomonte@bruegel.org) is a Non-resident Fellow at Bruegel and a Professor at Bocconi University

MARIA DEMERTZIS (maria.demertzis@bruegel.org) is Deputy Director at Bruegel

LIONEL FONTAGNÉ (lionel.fontagne@univ-paris1.fr) is a Professor at Paris School of Economics

STEFFEN MÜLLER (steffen.mueller@iwh-halle.de) is Head of Structural Change and Productivity at Halle Institute for Economic Research

MOST EUROPEAN UNION countries have made good progress with vaccinating their populations against COVID-19 and are now seeing a rebound in economic activity. While the scarring effects of the crisis and the long-term implications of the pandemic are only partially understood, the effects of support given to firms can be evaluated in order to help plan the removal of crisis support.

EUROPEAN REGIONS AND countries that depend heavily on services requiring physical proximity have been hit hardest by COVID-19-related measures. But these services sectors tend also to be the smallest and least-productive in any economy, implying that, coming into the crisis, the highest shares of zombie firms were in these sectors. Reliance on physical proximity and the higher incidence of zombies to start with have combined to make those services-dependent economies particularly vulnerable to any attempt to remove the support put in place during the pandemic.

THE EVIDENCE SHOWS that the main goal of the provision of support during the COVID-19 crisis, namely to protect employment, has been achieved. However, the evidence is varied on how efficiently this was done, in terms of helping firms that have a good chance of surviving, while not supporting those that will in any case exit.

AN ANALYSIS OF France, Germany and Italy shows the potential for ‘cleansing effects’ in that it was the least-productive firms that have been affected most by the crisis. While support was generally not targeted at protecting good firms only, financial support went by and large to those with the capacity to survive and succeed. Labour schemes have been effective in protecting employment.

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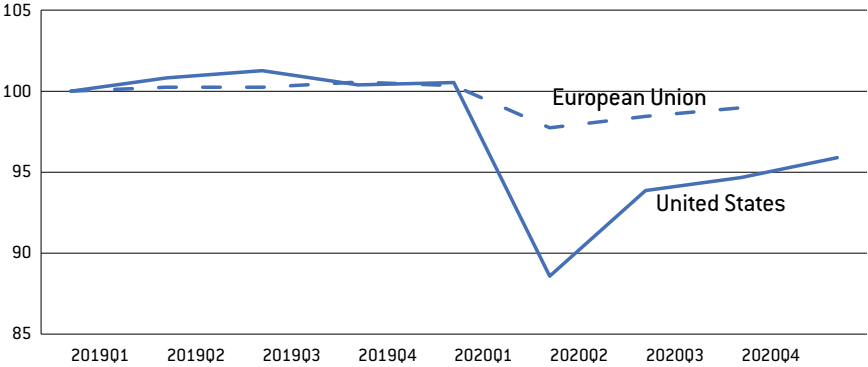
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1 Introduction

The support given to firms in European Union countries and the United States in the wake of COVID-19 to protect economic activity and employment has been unprecedented. In the EU, this support has prevented the emergence of unemployment and has kept average employment high. Employment in the EU has remained broadly constant while in the US, employment fell by more than 10 percentage points at the start of the pandemic, with subsequent recovery (Figure 1).

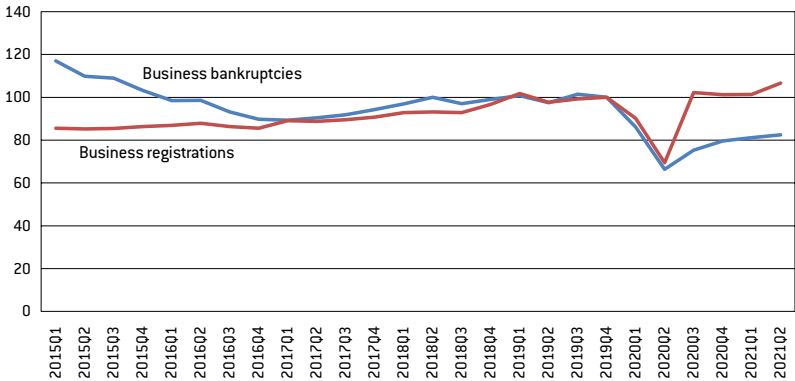
Figure 1: Employment levels, 2019Q1 = 100



Source: Bruegel based on Eurostat. Note: values are seasonally adjusted. The EU and US panels have different scales.

However, support given to firms has not been uniformly successful. The very generous support has also meant that the level of bankruptcies has remained far below pre-pandemic levels. The natural process of exits and entries has been affected without a clear indication of what this will mean for the future of productivity. Has productive value been protected, or have resources been spent to sustain otherwise unproductive firms? While new business registrations appear to have returned to pre-pandemic levels, bankruptcies remain artificially low (Figure 2)¹. This could indicate that the support provided is keeping unproductive firms alive. On the other hand, it is important to establish whether the recovery in the rate of new business registrations (Figure 2) marks a return to market dynamism or ‘forced’ self-employment resulting from the loss of employment.

Figure 2: Firm entries and exits, average EU (index Q4 2019 = 100)



Source: Bruegel based on Eurostat. Notes: Seasonally adjusted, EU data based on available countries.

¹ According to the latest available bankruptcy update from the Halle Institute for Economic Research, the number of corporate bankruptcies in Germany was still extremely low in August 2021.

As the rate of COVID-19 vaccination increases and the EU economy is steadily revived from its artificially comatose state, we ask three questions:

- Which EU regions are likely to see a wave of bankruptcies? We look at the levels of zombie firms pre-COVID-19 in European regions and how each of these regions has been affected by the pandemic, in terms of falling trade or closures of businesses that relied on close physical contact, such as services. We find that those countries/regions most likely to be affected by COVID-19-related measures were also those that entered the pandemic with higher shares of zombie firms.
- Has COVID-19 had a ‘cleansing effect’? Typically, less-productive firms are harder hit during a recession. We look at preliminary data for a number of countries to understand whether there has been a cleansing effect and observe that the least productive firms were indeed hit hardest.
- Has financial aid been productive? Because financial aid had to be given out quickly, it was given indiscriminately. In the trade-off between quickly reaching those in need, compared to reaching only those that can survive and be productive, speed was opted for, running the risk of inhibiting cleansing effects. The rationale was very much the preservation of employment, not necessarily the preservation of productive capacity. Now the recovery phase is underway, we can begin to evaluate whether financial aid ended up with the most productive firms and if not, what the extent is of misallocation of funds. This serves a dual purpose: evaluate the effectiveness of policies while helping to inform how measures should be phased out, at what speed and with what sequence.

2 More than one year of financial support: what next?

2.1 Which EU regions are most likely to see waves of bankruptcies?

To gauge the potential exposure of European regions to bankruptcies in the post-pandemic context, we looked at two variables: first, the share of ‘zombie’ firms by region before the pandemic, and second an index of exposure of local sectors to economic disruptions stemming from measures applied to reduce contagion risks. Those regions with both a larger share of zombie firms and sectors relatively more affected by COVID-19 restrictions (such as restaurants affected by lockdowns, to give but one example), are more likely to face a larger shares of bankruptcies as pandemic-related support measures are phased out and more normal market conditions return.

In line with CompNet (2020), we defined a zombie firm as a company that reports negative profits for three consecutive years, is more than 10 years old and is not characterised as ‘high growth’, ie its workforce has not grown by more than 20 percent in the past three years. We used Orbis company-level data to compute the share of zombie firms within each country (region), sector and year. Zombie shares at the country (region) level were then computed as averages across sectors, for the period 2015-2019².

We measured the exposure of sectors to pandemic-related contagion risks using the

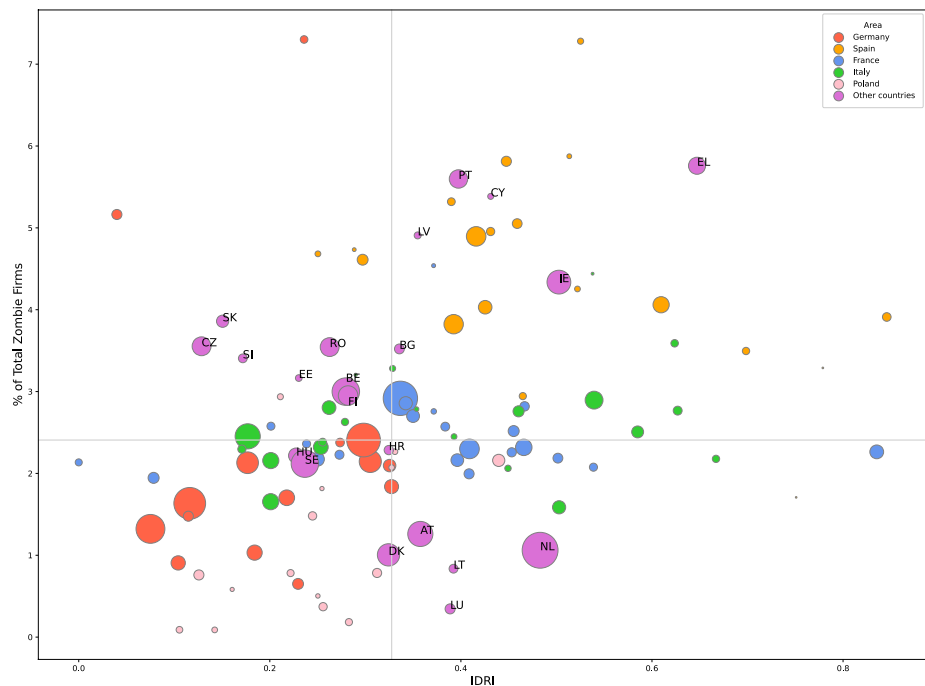
2 For robustness, we also computed shares of zombie firms using an alternative definition: companies who report interest coverage ratios below 1 for three consecutive years. Again, we restrict to companies that are 10 years old or more and that are not ‘high growth’ (20 percent increase in employment over the past three years). We also look at an alternative country (region) measure of zombie firms, computing the share only in specific industries that have been negatively affected by the pandemic (accommodation and food service activities, administrative and support service activities, education, human health and social work activities, arts, entertainment and recreation and other service activities), with similar results.

Internal Disruption Risk Indicator (IDRI), which is an indicator of physical proximity of persons in production and distribution processes³. The higher this indicator, the higher the percentage of firms in an area in sectors affected by COVID-19-related restrictions and which are therefore likely to experience difficulties.

For the largest EU economies (Germany, France, Italy, Poland and Spain) we looked at the zombie shares and IDRI at regional level⁴. For the other EU countries, we looked at country-level data.

Figure 3 shows IDRI for each geographical area plotted against the share of zombie firms operating in each area on average from 2015 to 2019. The size of each bubble is proportional to each region's GDP. Vertical and horizontal lines represent the median EU IDRI and share of zombie firms, respectively (further charts with alternative definitions of zombie firms to check robustness are available on request).

Figure 3: IDRI versus share of zombie firms (2015-2019 average)



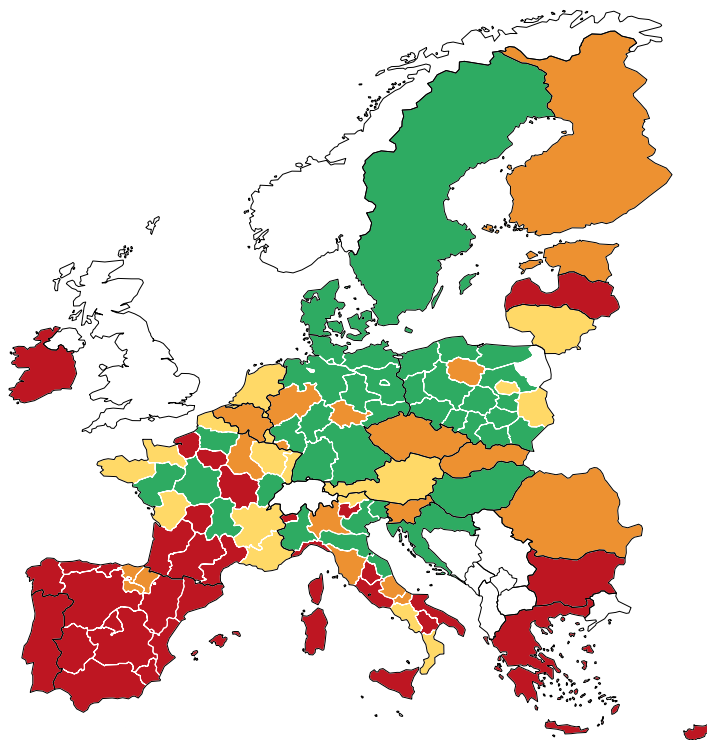
Source: Bruegel based on ORBIS and IDRI.

A first striking result is the positive relationship between the IDRI score and the share of pre-pandemic zombie firms (Figure 3). In other words, many of the regions strong in sectors that were likely to be affected by COVID-19-related restrictions also had high shares of zombie firms before the pandemic. Figure 4 summarises this: red for regions/countries with high zombie shares/high prevalence of affected sectors, green for low zombie shares/low prevalence of affected sectors, yellow for low zombie shares but high prevalence of affected sectors, and orange for high zombie shares but low prevalence of affected sectors.

3 The IDRI uses an official classification of economic activity in terms of firms' exposure to potential contagion risk, as a function of the physical proximity required in the production and distribution process. The indicator thus measures the extent to which local areas are affected by disruptions arising from the introduction of safety regulations in the workplace, depending on their regional-level sectoral specialisation as quantified by labour shares in each sector. For more details, and an application to all EU regions, see Altomonte *et al* (2020). The Appendix details the formal construction of the index.

4 NUTS for Germany and NUTS2 for the other four. NUTS1 corresponds to German *Länder*, NUTS2 to regions, *départements*, comunidades autónomas and voivodships in Italy, France, Spain and Poland, respectively.

Figure 4: A summary of vulnerabilities



Source: Bruegel. Note: Regions/countries in red have high zombie shares/high prevalence of affected sectors. Green = low zombie shares/low prevalence of affected sectors. Yellow = low zombie shares/high prevalence of affected sectors. Orange = high zombie shares/low prevalence of affected sectors.

One reason for this correlation is that firms operating in services sectors have been particularly exposed to the economic disruptions stemming from the pandemic, as both production and distribution in these sectors typically require high levels of personal contact. At the same time, firms in services sectors tend to be smaller and less productive, and hence more likely, all things being equal, to become zombies.

Countries including Spain, Greece, Portugal and Cyprus are especially exposed, with high IDRI scores and large shares of zombie firms. More than 4 percent of firms were zombies in virtually all regions of Spain from 2015 to 2019. Although many Italian regions have high IDRI scores (because of the importance of tourism and services sectors), the relative share of zombie firms is lower, because of the significant restructuring that had already happened as a result of the debt crisis.

2.2 The impact of financial support on productivity: country results

Based on data for Italy, Germany and France, we analysed next whether COVID-19 affected companies differently depending on their level of productivity. We also aimed to identify whether support given was uniform across firms, and therefore indiscriminate, or in line with their levels of productivity. We used the level of pre-crisis productivity, starting from the viewpoint that support should have gone primarily to firms that: i) were heavily affected by the pandemic but, ii) are also worth rescuing with taxpayers' money. Policies that direct support to good (ie productive) firms are then preferable to indiscriminate policies.

Evidence shows that in all three countries, there have been cleansing effects. In Italy, firms that were less productive before COVID-19 faced higher risk of default during the pandemic. A few firms that were classified as productive became almost zombies, or 'zombie-lite' during the pandemic. Similar results occurred in France and Germany. In France insolvencies caused by the crisis have been concentrated in the least-productive firms. Nevertheless, some firms with higher-than-average levels of productivity were also hit hard.

When it comes to the way public support was allocated, however, the picture is not entirely

the same in all countries. In France (section 2.2.3), public support measures appear to have had a neutral impact on the distribution of insolvencies across all levels of firm productivity. In Italy (section 2.2.1), public support appears to have been in line with productivity for medium and large firms. However, support for the smallest firms was more strongly misallocated as, among those firms, more support was given to relatively low-productivity firms. Last, in Germany (section 2.2.2) the use of short-time work schemes appears to have been productivity-neutral, while less-productive firms have been much more likely to receive financial support than highly productive firms.

2.2.1 Italy

We merged firm balance-sheet information with data on the allocation of financial support received during the COVID-19 crisis in 2020⁵. We ended up with a sample of 1,030,899 SMEs that received a total of €115 billion in guaranteed loans (the average public guarantee on the loan was 85 percent). The sample represents 96 percent of all loans granted to SMEs in Italy, covering firms employing 5.8 million people.

We also merged information on each firms' credit risk score⁶ and divided firms into six categories: safe; financially vulnerable but not impacted by the COVID-19 shock; financially vulnerable and impacted by the COVID-19 shock; financially risky and impacted by the COVID-19 shock; 'zombie-lite', or firms brought to the brink of default by the COVID-19 shock; and zombie firms. Based on 2018 data, we calculated (median/average) productivity both as sales per employee and value added per employee⁷.

Table 1 shows evidence of a 'cleansing' effect. As the credit risk increases, from 'safe' to 'zombie' firms, the level of productivity decreases. Firms that were less productive in 2018 turned out to be more at risk of default at the end of 2020. We show this result for both median and average levels of productivity.

Table 1: Productivity and risk of default

Credit risk score post-COVID-19	Median productivity		Average productivity	
	Sales per employee	Value added per employee	Sales per employee	Value added per employee
Safe	134.5	39.3	264.1	53.5
Vulnerable non-impacted	117	30.8	218.1	41.6
Vulnerable impacted	90	29.7	158.2	41.6
Risky impacted	60.8	26.5	90.6	35.8
Zombie-lite	84	26	143.8	36.9
Zombie	87.7	23	143.1	33.2
Total sample of firms	108	31.7	213.2	45.3

Source: Bruegel based on CERVED data available in M&M (2021). Note: Productivity calculated based on 2018 data.

We then used information on the allocation of loans to check whether firms that were more productive in 2018 received relatively higher intensities of loans (defined as the ratio of loans to sales). We divided firms into five quintiles of productivity and four size categories, based on turnover (Table 2).

Table 2 shows that loan intensity appears to be broadly in line with productivity (higher intensity for higher quintiles of productivity), for all firm size categories, with the exception of the smallest firms (turnover below €1 million). In this group, the least-productive firms

⁵ Working with CERVED, a data-analysis company.

⁶ An index calculated by CERVED and used by banks to assess credit risk.

⁷ For more details, see Altomonte (2021).

received relatively greater loan intensities. Thus, while support has gone to unproductive larger firms, the degree of potential misallocation of funds was most significant within the group of smallest firms.

Table 2: Loans and productivity (median of intensity of loan)

Productivity (from least to most)*	Size class (turnover)				Average total
	< €1m	€1m-€5m	€5m-€10m	> €10m	
1st quintile	15.6%	6.9%	8.9%	6.3%	14.9%
2nd quintile	11.6%	8.4%	8.9%	8.8%	11.1%
3rd quintile	10.4%	10.2%	11.1%	9.4%	10.3%
4th quintile	10.2%	11.6%	12.3%	10.1%	10.8%
5th quintile	10.9%	12.6%	13.0%	9.5%	11.3%
Total sample of firms	12.2%	10.9%	12.0%	9.5%	

Source: Bruegel based on CERVED data available in M&M (2021). Notes: *Productivity from least to most, measured as valued-added per employee (2018). Intensity of loan defined as the ratio of loan to sales.

This potential misallocation to the smallest firms can be explained by a particular feature of the public guarantee in Italy, by which loans up to €25,000 received a 100 percent public guarantee, without any bank scrutiny (compared to a standard guarantee of 80 percent of public coverage). Standard loans (80 percent guarantee with bank screening) made up roughly 85 percent of loans, and appear to have been allocated in line with productivity (also controlling for firm size). Micro-loans (<€25,000) with a 100 percent guarantee (no bank screening), amounted to €21.7 billion, or 15 percent of total loans, and mostly went to very small companies with turnovers below €1 million (90 percent of these loans went to micro companies).

Italian firms with more than 10 employees, constituting around 11 percent of total firms in the sample, are relatively productive and have received 64 percent of the total funds. Firms with fewer than five employees, some relatively unproductive, constitute 76 percent of the sample, and have received 23 percent of total funds.

There are two ways to evaluate the economic impact of possible defaults as public support measures are phased out. The first is to look at the financial loss equal to the value of the loan given to the company that defaults. Table 3 shows that the value of all loans at risk is estimated to be just below €9 billion, 7.8 percent of total loans in the sample. Zombie-lite and zombie firms account for just over €5 billion. There is therefore a limited risk to financial stability, as a result of phasing out financial support.

Table 3: Risk of default and its economic cost

	Loans (€ millions)	Loans at risk (€ millions)	Employees	Employees at risk	No. of firms
Safe	45,969	776	2,239,115	38,803	308,172
Vulnerable non-impacted	31,726	2,211	1,361,157	96,200	284,516
Vulnerable impacted	13,901	759	864,230	48,231	181,884
Risky impacted	727	137	55,410	9,970	9,347
Zombie-lite	14,008	2,619	789,239	157,989	166,071
Zombie	8,731	2,486	477,471	149,784	80,909
Total sample of firms	115,062	8,988	5,786,622	500,976	1,030,899

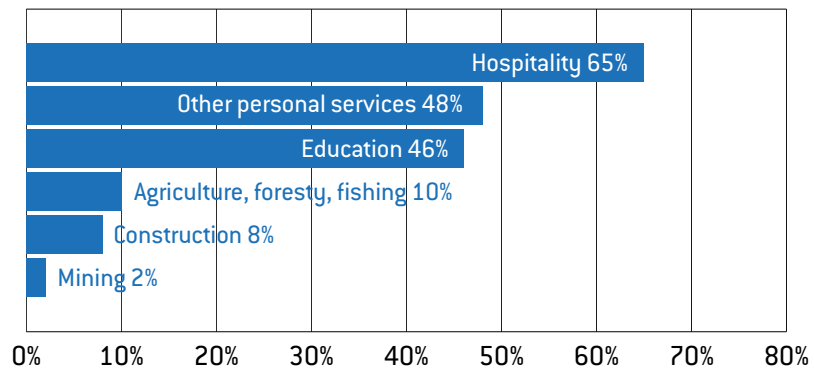
Source: CERVED Group estimates, as reported in M&M (2021). Note: Loans and employees at risk calculated applying to each firms its probability of default based on the credit risk score.

The second way to assess the impact is to calculate the jobs at risk, should a certain number of firms default. This is potentially much more serious than the financial impact, with 500,000 people at risk from corporate defaults. Most of these jobs are in zombie or zombie-lite firms that also the least productive. More specifically, 23 percent of total jobs at risk come from the hospitality industry (food service and hotels), which represents only 12 percent of firms and only 5 percent of loans, but 28 percent of all zombie-lite firms. Also note that the employment estimate is a lower bound, as it does not include those employees who might be laid off by surviving firms in order to restore profitability, as short-time work schemes are phased out.

2.2.2 Germany

A quarter of German firms claimed to have been hit hard by the first wave of the pandemic⁸. Sectors similar to those in other countries, in particular hospitality, have been affected by social distancing measures (Figure 5), although these sectors are not as central to Germany's economy as they are for other countries, such as Austria and Italy. What did matter for Germany however, was the initial breakdown of international value chains, particularly for the strongly international integrated manufacturing sector.

Figure 5: Percentage of firms hit hard by the crisis (by sector)

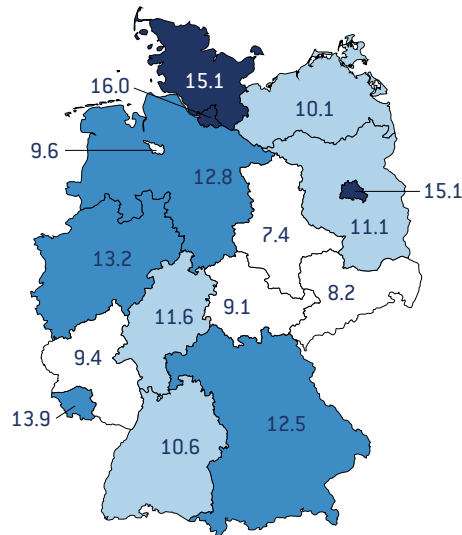


Source: Bruegel based on IAB establishment panel.

Initially, about one in eight firms self-assessed as close to market exit because of the pandemic, with large variations by German *Länder*. Urban centres and the west of the country were more affected in terms of firms coming close to exiting the market (Figure 6).

⁸ All calculations for Germany are based on the IAB establishment panel 2020 run by the Institute for Employment Research (IAB) and refer to July-September 2020 (see https://fdz.iab.de/en/FDZ_Establishment_Data/IAB_Establishment_Panel.aspx). We weight the data using cross sectional weights provided by the IAB. A general description of the data set is provided by Ellguth *et al* (2014).

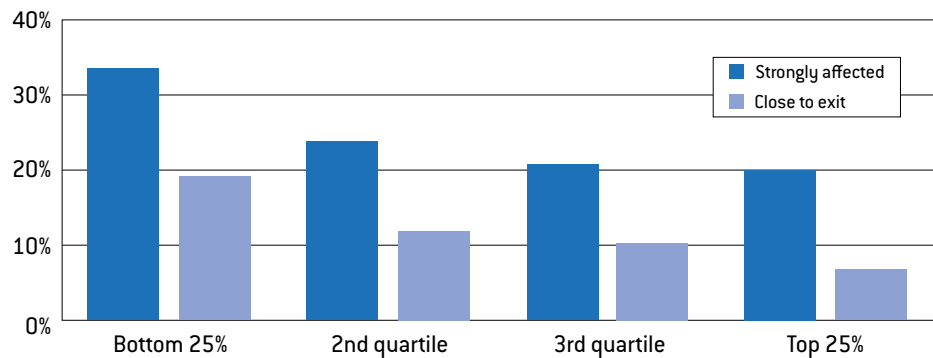
Figure 6: Percentage of firms close to market exit (by region)



Source: Bruegel based on IAB establishment panel.

As in Italy, less-productive German firms were hit hardest. Figure 7 ranks firms by their pre-pandemic labour productivity levels. One third of the least-productive firms (lowest quartile) reported being hit hard, whereas this was only the case for about one fifth of the most-productive firms. Similarly, 19 percent of the least-productive firms were close to exit, compared to just 7 percent of the initially most-productive firms⁹. While this shows the potential for cleansing effects, it also tells a cautious story about the potential of losing very productive firms. A careful policy would certainly try to avoid losing 7 percent of the country's most-productive firms.

Figure 7: Impact of the COVID-19 pandemic by 2019 labour productivity quartile



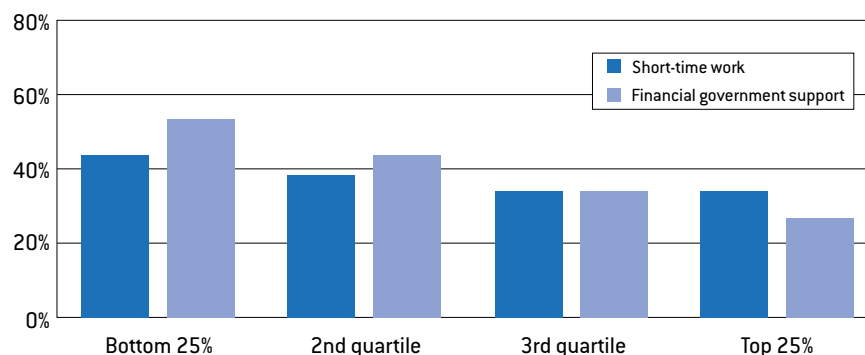
Source: Bruegel based on IAB establishment panel.

Figure 8 shows how government aid was distributed with respect to initial firm productivity. In the figure, we distinguish between financial aid and the use of the generous short-time work scheme because the motives for take-up differ. While financial aid is more like emergency help, short-time work schemes are attractive for firms that try to maintain their well-trained workforces. Hence, short-time work schemes will more likely help relatively productive firms with high hiring (training) costs. Figure 8 supports these conjectures by

⁹ The link between productivity and both outcomes still holds when plant size and sector/region fixed effects are netted out in a regression setting.

showing that financial aid was taken up predominantly by unproductive firms. By contrast there is no strong relationship between the uptake of short-time work schemes and the level of firm productivity¹⁰.

Figure 8: State aid in Germany by 2019 labour productivity quartile



Source: Bruegel based on IAB establishment panel.

We do not have micro data on the amount of German government loans so are unable to evaluate the potential financial implications of company defaults. However, we can evaluate the risk using employment data. Although a higher fraction of unproductive firms was hit hard, they typically employ fewer people. Table 4 confirms this by showing that the relatively few high-productivity firms hit hard by the pandemic employed 50 percent more workers than the many low-productivity firms that were also hit hard (Table 4, left panel; 2.26 million compared to 1.4 million). In each of the productivity quartiles, about 500,000 workers work in firms that are close to exit (right side of Table 4). This means that if expressed as number of jobs instead of number of employers, the pandemic primarily hit good jobs in productive firms. As these firms are more resilient to crises, the number of jobs in firms that are close to exit is however more evenly spread over the firm productivity distribution.

Table 4: Affected jobs by firm productivity (in million workers)

	Hit hard by pandemic		Close to exit due to pandemic	
	No	Yes	No	Yes
Labour productivity 2019	Mln workers	Mln workers	Mln workers	Mln workers
Bottom 25%	2.76	1.40	3.62	0.54
2nd quartile	3.02	1.03	3.64	0.41
3rd quartile	3.90	1.37	4.85	0.42
Top 25%	7.88	2.26	9.60	0.54
Total	17.60	6.05	21.70	1.90

Source: Bruegel based on IAB establishment panel.

¹⁰ In fact, when controlling for establishment size and sector/region fixed effects affiliation in a regression framework, the productivity gradient prevails for financial aid and is non-existent for take-up of short-time work. This implies that financial aid is more likely than short-time work schemes to generate zombie firms.

2.2.3 France

The distribution of public support and its effectiveness in France were scrutinised in a July 2021 report prepared by the Committee on the Monitoring and Evaluation of Financial Support Measures for Companies Confronted by the COVID-19 Epidemic (Cœuré, 2021; Cœuré committee hereafter)¹¹. A combination of four main emergency measures was implemented: a short-time work scheme, a 'Solidarity Fund', state-guaranteed loans and deferral of social security contributions. Commercial courts were also closed temporarily, which *de facto* impacted bankruptcies. Finally, additional measures were introduced in the wake of the second virus wave, including provision of compensation for companies' fixed costs, corporate tax loss carry-backs, and, even more specifically, compensation for the stopping of ski lifts in winter resorts. In order to maximise eligibility, this support is not making it conditional on various criteria. This has the consequence of potential windfall effects, a choice that was acknowledged in implementing the measures.

To evaluate the measures, the Cœuré committee matched firms' balance sheets, VAT data and other administrative information for the 3.5 million businesses that received support, for the period from 1 April 2020 to 30 March 2021. The benefitting companies received €53 billion in subsidies and €148 billion in loans.

In France as in other European countries, notwithstanding differences in the details of implementation of public support, the combination of state-guaranteed loans and the temporary halt in investment led to an increase in the cash position of the businesses that received support. Business insolvencies reduced by 39 percent in 2020 compared to 2019. Bénassy-Quéré *et al* (2021) showed that while the percentage of all firms entering insolvency increased from 3.6 percent to 6.6 percent from March to December 2020, this increase would have been to 11.9 percent without the measures.

Overall, the measures managed to cushion the impact of the pandemic and the lockdown on firms' gross operating surpluses. There was a €45 billion drop in the operating profits in 2020, compared to 2019. A drop in their gross operating surplus was experienced by 59 percent of French companies in 2020. Estimates from the Cœuré committee suggest that this number would have been 72 percent without the support schemes. These measures prevented any drop in the surplus during the second wave. The hospitality sector received the most support (worth up to 99 percent of its pre-crisis gross operating profits). Three sectors actually saw their surpluses increase during the crisis (IT, agriculture and household services).

A good indicator of the potential impact of the short-term work scheme is the ratio of hours compensated for under the scheme to total paid hours. This ratio peaked at 29 percent in the private sector in April 2020 and went down to 5 percent in May 2021.

On the characteristics of firms that received support, small firms in France contribute an 18 percent share of private employment but have received a much larger share of support. Small businesses benefitted from 63 percent of the payments from the solidarity fund, 49 percent of the deferrals of social contributions, 33 percent of payments under the short-time work scheme, and 29 percent of state-guaranteed loans.

In terms of financial health, the evidence is mixed. Firms that were low and high profitability before the pandemic are underrepresented in the sample of supported businesses. However, the lowest profitability firms received relatively larger amounts (support relative to turnover before the pandemic). This mixed evidence suggests low-productivity firms had limited access to the schemes, but those that did receive support were relatively more supported.

Zombie firms made up 7.2 percent of French firms in the private sector (excluding finance and agriculture) in 2018, but only half of zombie firms (3.4 percent of supported firms) benefitted from at least one measure during the first wave of the pandemic (during the second wave, the figure was 3 percent). But using a different criterion more representative of firm size – the

¹¹ Comité de suivi et d'évaluation des mesures de soutien financier aux entreprises confrontées à l'épidémie de Covid-19. See Cœuré (2021) and Bénassy-Quéré *et al* (2021).

number of employees – support has been aligned with the share of zombie firms in total employment. The same conclusion pertains to the share of zombie firms in the capital stock or in value added.

Table 5: Share of zombie firms in the French economy and support received

		Share of all firms receiving support that are zombies	Share of all firms that are zombies (2018)
Number of firms	First wave	3.4	7.2
	Second wave	3.0	
Number of employees	First wave	6.8	7.5
	Second wave	6.2	
Capital (incl. intangibles)	First wave	7.2	8.1
	Second wave	6.7	
Value added	First wave	3.7	4.0
	Second wave	3.4	

Source: adapted from Cœuré (2021), p. 282.

On the whole, evidence from France, covering more than 6 million firms, 3.5 million of which received COVID-19 aid, shows that the supported firms were also those that needed it most. The evidence also showed that not all firms requested the help to which they were entitled and zombie firms were not disproportionately supported. Support helped prevent insolvencies, but there is not enough evidence to conclude whether or not support boosted firms' subsequent performances.

Evidence from smaller countries indicates similar outcomes to France. On Croatia, Finland, Slovakia and Slovenia, Bighelli *et al* (2021, 2021a) reported that government support was provided efficiently. Most of the help given reached medium-sized productive firms, and only marginal funds were 'wasted' on unproductive (zombie) firms. Bighelli *et al* (2021, 2021a) argued however that funding was not sufficient to reverse the big productivity decline caused by the pandemic. While initial help was there to maintain employment, this support, they argued, will have to be phased out as early as possible, so that new support can help restore and increase firm productivity.

3 Literature on phasing out support measures and financial stability

One of the main sectors offered support during the pandemic has been the banking sector. Specific measures included moratoria on loan payments, public guarantees and capital relief measures. When and how should these measures be unwound and what risks does that entail?

A number of papers have attempted to answer these questions. Haselmann and Troger (2021) used German micro-level data and predicted significant capital shortfalls, which could jeopardise investor confidence and fuel financial instability. They argued in favour of ending accounting practices that conceal loan losses and suggested that while banks with no realistic prospect of meeting regulatory capital requirements should be forced to exit the market, others should be recapitalised (taking the US Troubled Asset Relief Program as an example).

Lehmann (2021) noted that, by the third quarter of 2020, payment moratoria covered 6.4

percent of euro-area corporate loan stock, which will inevitably be associated with substantial credit risk. He argued that, among other things, the supportive measures put the scrutiny of banks' management of non-performing loans at risk and the ECB should monitor banks' practices more closely in terms of the credit risk of individual borrowers. Finally, Beck *et al* (2021) agreed that restoring banks' balance sheet transparency is a priority. Before unwinding capital relief measures, authorities should first phase out borrower relief measures and relax loan classification. Importantly, phasing out of measures should be communicated clearly to enable banks to adjust balance sheets (Beck *et al*, 2021).

The European Commission's Directorate-General for Financial Stability, Financial Services and Capital Markets Union (European Commission, 2020) argued in favour of reforming insolvency frameworks and further developing secondary markets for distressed assets in order to move non-performing loans off banks' balance sheets. The European Commission further believes that the EU Recovery and Resilience Facility can support reforms that aim to reduce non-performing loans, while stressing that market-based solutions should remain the first and primary tool.

The Financial Stability Board (FSB, 2021) noted that, regarding financial stability in general, there is a trade-off between procyclical risks in case of sudden withdrawal of support measures and the progressive development of financial stability risks linked to these support measures (distortion of resource allocation and asset prices, moral hazard, deterioration of credit quality). Authorities should ensure that measures are targeted by, for instance, requiring beneficiaries to opt in. Generally, terms should be made progressively less generous and authorities need to clearly communicate about the sequence of withdrawal of support.

While Laeven *et al* (2020) noted the risk of zombification, they argued that the COVID-19 crisis is different to previous crises because it also hit viable sectors. They argued that in order to avoid the zombification of the economy, credit guarantees need to be fine-tuned, governments should incentivise financing through equity instead of debt, and that supervisory authorities need to ensure that banks maintain sound capital positions. More generally, they argued in favour of improving the efficiency of the insolvency framework and bankruptcy laws. Helmersson *et al* (2021) looked at firm-level and loan-level data and found that zombies only benefitted from loan schemes to a modest degree. Helmersson *et al* (2021) agreed that insolvency frameworks should be reformed.

Finally, the OECD (2021) argued that countries need to provide clear roadmaps on pathways to recovery. Among other things, they suggested that countries should provide support for search and career guidance and training activities for employees (and more specifically in the sector of digitalisation).

4 Conclusions and way forward

European regions and countries that depend heavily on services requiring physical proximity have been hit hardest by COVID-19-related measures. But these services sectors tend also to be the smallest and least-productive in any economy, implying that, coming into the crisis, the highest shares of zombie firms were in these sectors. Reliance on physical proximity and the higher incidence of zombies to start with combine to make those services-dependent economies particularly vulnerable to any attempt to remove the support put in place during the pandemic.

Nevertheless, as countries recover, there is a need to remove support and allow markets to return to picking natural winners and losers.

The evidence shows that the main goal of the provision of support during the COVID-19 crisis, namely to protect employment, was achieved. However, the evidence is varied on how efficiently this was done, in terms of helping firms that have a good chance of surviving, while

not supporting those that will in any case exit.

The design of schemes matters, as shown in both Italy and Germany where support was allocated in line with firm productivity.

Partial, not full, public guarantees for loans gave banks an incentive to carry out due diligence and identify those firms most likely to survive. In Italy, this meant that the bulk of loans given were in line with productivity. This also implies that the probability of default is lower for large firms and as only small loans were potentially misallocated, a wave of defaults among small firms will not pose a financial-stability problem.

Similarly, in Germany, short-time work schemes reached the most-productive firms. The big and productive firms with the best-trained workforces had an incentive to use these schemes to try to maintain their workforces.

In thinking of how to move forward, there are broader issues to consider. The in-line-with-productivity argument implies that it is advisable to support large rather than small firms. Big firms are more likely to be productive. Also wage losses associated with being made unemployed are greater for workers leaving large firms (Jacobson *et al*, 1993; Fackler *et al*, 2021). However, small firms also employ collectively a large number of people. Phasing out support and letting small firms default may imply, as our evidence has shown, substantial employment losses. Moreover, this would go against the rationale of the indiscriminate support for employment given in the initial phase of the crisis. On top of economic efficiency, other issues must thus be considered, given that small firms play a very important role in terms of social cohesion. Minimising the cost to the taxpayer needs to be balanced carefully against the importance of maintaining employment.

Tax incentives could be one concrete way of balancing the return to functioning markets while protecting viable firms as support is phased out. Firms are usually entitled to count current losses against previous profits when filing corporate tax returns. Making this scheme much more generous would help precisely those firms that should be protected – those that incurred losses because of the pandemic but were profitable before the crisis. In contrast, all undirected support schemes, including cash injections and exemptions from the obligation to file for bankruptcy, can be distortionary and should be removed early on. Exceptions for young firms, which by definition cannot count today's losses against previous profits, should be part of the policy toolbox.

The French data shows that support given during the pandemic crisis has been productivity-neutral: it did not favour any specific type of firm and therefore did not alter the dynamism of the French economy. But the COVID-19 shock may have been transformative in terms of the long-term impact on productivity. Advances in digital technologies and their accelerated take-up during the pandemic are behind the observation of Brynjolfsson *et al* (2021), who showed that most OECD countries still have to gain from digitalisation in terms of productivity. Building on this argument, Brynjolfsson and Petropoulos (2021) were very optimistic that the combination of accelerated take-up in digital technologies during the pandemic and massive macroeconomic support will boost productivity.

Arguably, COVID-19 has forced firms to become more efficient. Firms caught in sudden and prolonged shutdowns of the economy have had to optimise processes, cut costs and become more efficient. This has meant that firms have had to become more innovative, and to digitise and automate as much as possible. Those who managed it thus increased their overall agility. In a survey reported by Maqui and Morris (2020), 75 percent of firms agreed that the pandemic has helped make their businesses more efficient and resilient. Nine out of 10 firms had sped up the adoption of digital technologies and automation.

If this gives rise to new and more productive firms, then a higher degree of employment churning and re-skilling should perhaps be encouraged, as a way of adapting to new technological needs. Coupled with short-term unemployment support, this might be a better method of creating new jobs sustainably but not at the expense of welfare in the short run. It may be too soon to conclude that COVID-19-induced changes will necessarily lead to higher productivity but longer-term changes will also need to guide short-term measures in terms of phasing out support.

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Appendix

Technical note on the computation of the Internal Disruption Risk Indicator (IDRI)

IDRI is calculated for a given area by leveraging a detailed measure of risk exposure developed at sector-level by Inail (2020). Inail classified industries at the ISIC/NACE 2-digit level according to three characteristics:

- Contact: the probability of social contact while at work premises (the index has a value from 0, denoting low probability, eg in the case of agriculture, to 4, denoting high-probability, eg in the case of nurses);
- Proximity: the intrinsic characteristics of the workflow that do not allow for sufficient social distancing (the index value runs from 0, denoting working alone, to 4, denoting work in close contact with other people);
- Aggregation: the level of contact with subjects other than the firm's workers (eg restaurants, education, also with values from 1 to 4).

Publicly available data include a combined index that considers the two measures of contact and proximity ($risk_{class}$), plus the aggregation index ($weight_{aggregation}$). We use the aggregation index ($weight_{aggregation}$) to weight the first risk measure ($risk_{class}$). In doing so, we assign a value ranging from 1 to 1.5 to each social-aggregation risk class (i.e. to $weight_{aggregation}$), following Inail (2020). The final risk measure at the NACE 2-digit level is thus:

$$risk_{weighted} = risk_{class} * weight_{aggregation}$$

We then built a regional-level measure by using the labour share for each sector within the region as weights. Denoting by a the region and by j the sector, IDRI is then given by:

$$IDRI_a = \sum_j \frac{L_{aj}}{L_a} * (risk_{class} * weight_{aggregation})$$