



INVESTMENT REPORT
2021/2022



Recovery as
a springboard
for change

Chapter 3
**Firms: Policy support,
asymmetry and risks of scarring**

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Recovery as a springboard for change

Part II Recovery from the COVID-19
pandemic, scarring and asymmetry

Chapter 3 **Firms: Policy support, asymmetry and risks of scarring**

Investment Report 2021/2022: Recovery as a springboard for change.

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About the Report

The EIB annual report on Investment and Investment Finance is a product of the EIB Economics Department. It provides a comprehensive overview of the developments and drivers of investment and its finance in the European Union. The report combines an analysis and understanding of key market trends and developments with a more in-depth thematic focus, which this year is devoted to Europe's progress towards a digital and green future in the post-COVID-19 era. The report draws extensively on the results of the annual EIB Investment Survey (EIBIS) and the EIB Municipality Survey. It complements internal EIB analysis with contributions from leading experts in the field.

About the Economics Department of the EIB

The mission of the EIB Economics Department is to provide economic analyses and studies to support the Bank in its operations and in the definition of its positioning, strategy and policy. The director of Economics Department, Debora Revoltella, heads a team of 40 economists.

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Published by the European Investment Bank.

Printed on FSC® paper.

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Acknowledgements

José María Alvarès, Enrico Minnella, Luca Restaldi and Nicola Vianello provided research assistance.

Chapter 3

Firms: Policy support, asymmetry and risks of scarring



Download the complete report:
www.eib.org/investment-report-2021
www.doi.org/10.2867/82061

Available as:

print: ISBN 978-92-861-5156-9 ISSN: 2599-8269
pdf: ISBN 978-92-861-5155-2 ISSN: 2599-8277

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Chapter 3

Firms: Policy support, asymmetry and risks of scarring

The COVID-19 crisis is unfolding very differently from the great financial and sovereign debt crises. This time, policy support — from central banks, financial supervisory agencies, governments and European institutions — is massive and prolonged. Corporate investment is taking a hit, but the impact is well below what was feared at the beginning of the crisis.

As the crisis has continued, it has affected countries and industries differently, and vulnerability has grown. When the pandemic struck, firms borrowed money as a precautionary measure to ensure that they could finance their inventories, costs and working capital. As the crisis went on, risks of defaults and insolvency rose as profits fell. Each successive lockdown has become more targeted. Vulnerability is increasing, but unevenly. Certain industries and types of firms have been hit harder, with smaller companies particularly affected. Because EU members are exposed to the hardest hit industries unevenly, the crisis is affecting them differently, and the risk of asymmetric recovery is growing. Efforts to repair the damage done to corporate finances are dragging down investment, but elevated cash positions and a strong capital base are enabling firms to weather the crisis, as is effective and protracted policy support.

Public support went to the firms most weakened by the crisis, those whose sales shrank the most. Government support was widely distributed, reaching the firms that sustained the steepest losses in revenue as a result of the pandemic. So far, the EIB Investment Survey (EIBIS) for 2021 has unearthed no evidence of public support being misallocated to zombie firms that will be unable to pay off their debts.

Public support has enhanced companies' ability to rebound from the crisis. Policy intervention has weakened the link between sales losses and the scaling down of investment plans. One example is investment in digitalisation. As firms realised how digital capabilities and services could help them weather the crisis, they began to put more emphasis on digital investment. Public support was especially effective in enabling firms to pursue digitalisation, despite the decline in their sales.

Policymakers must navigate the dangers of phasing support out too early, which would jeopardise the recovery, and phasing it out too late, which could weaken the economy in the long term. Several countries have already withdrawn measures that supported firms. Maintaining these measures must be weighed against the risk of hampering the process of creative destruction and possibly lowering economic growth in the medium term.

Introduction

This chapter focuses on corporate investment, and the policies deployed to support firms. It reviews the major developments in corporate investment and financing in the European Union since the beginning of the COVID-19 crisis. At the macroeconomic level, investment has not behaved in line with historical patterns, reacting less to the collapse in economic activity in 2020 than might have been expected. This chapter examines the resilience shown by firms, the economic implications of the crisis for them and the likely consequences for their decision-making. It shows that the overall positive picture masks uneven trends among sectors, and hides the degree to which some firms were weakened by the pandemic.

The first section details how and why the COVID-19 crisis has unfolded very differently from the global financial and sovereign debt crises. Thanks to the policy support deployed during the pandemic, financial conditions and lending terms have remained benign.

The second section analyses the rise in corporate vulnerability. As lockdowns have targeted more specific areas and become less synchronised across different countries, the impact on sectors and firms is increasingly uneven. This asymmetry is compounded by differences in the efficiency of insolvency procedures, posing a risk to a shared recovery across the European Union. Box A specifically focuses on the different trends of high-growth firms during the crisis.

The third section dissects the nature and allocation of public support. This section analyses the diversity of the support provided across European countries. It then shows that support has been allocated efficiently to the most vulnerable — smaller firms and the worst hit — and not tilted to zombie firms unable to do more than service their debt. Box B focuses on the national credit guarantee programmes and the **European Guarantee Fund**.

The fourth section focuses on the recovery. It examines the factors determining whether firms emerge from the crisis stronger. It first looks at the capacity of firms to move across productivity groups. It then reviews the impact of the crisis on their investment and digitalisation. Two boxes are included in this section. The first provides an overview of the literature on policy support. The second summarises the results of the latest venture capital and private equity survey.

The crisis so far vs. the global financial and sovereign debt crises

Access to finance has evolved very differently in this crisis. During the global financial and sovereign debt crises, the flow of credit to firms dried up in several European countries as banks tightened credit standards in response to tensions in bank funding markets and the European sovereign bond market. Companies were forced to deleverage under harsh conditions, and they therefore reduced their investment. During the COVID-19 crisis, firms first shored up their liquidity. Government guarantees allowed them to continue to borrow money, even though their indebtedness increased. The current low cost of debt makes stockpiling cash sustainable in the short term. Later on, however, firms will either have to pay back their debt or roll it over at potentially higher interest rates.

Investment financing conditions

The European Central Bank's policy has restored confidence and maintained benign financial conditions. The European Central Bank (ECB) reacted quickly and boldly to the crisis, effectively maintaining the flow of credit (Altavilla et al., 2020). Financial conditions tightened sharply in the first month of the crisis, but quickly eased and have remained at low levels since then (Figure 1). In the euro area, the yield spreads between EU members' sovereign debt remained narrow as ECB bond purchases largely held risk

premiums in check. The accommodative financial conditions are supporting access to finance and have helped keep the cost of borrowing low, partly compensating the uncertainty caused by the pandemic.

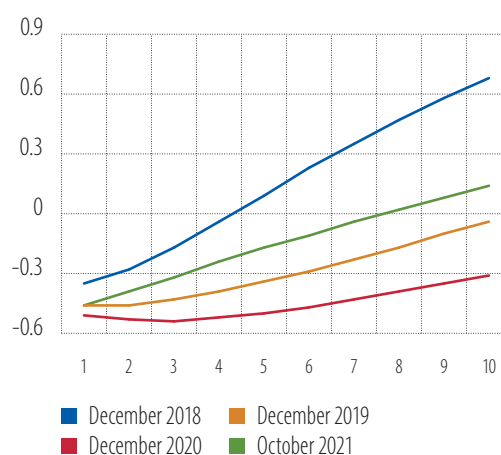
The euro swap curve, which acts as a benchmark for European bonds, reached record lows in December 2020 and has steepened somewhat since then. Figure 2 shows snapshots of the yield curve at various periods. The yield curve was already relatively flat before COVID-19 struck. But it flattened further during the first year of the crisis, with ten-year yields on the euro swap curve reaching -30 basis points in December 2020. Since then, several factors have contributed to a steepening of the curve. First, the vaccination rollout encouraged a gradual return to a form of normality. Second, the US and European economies bounced back strongly. Third, inflation expectations rebounded.

Figure 1
Euro area financial conditions index
(rise=tightening)



Source: EIB estimates based on Andersson et al. (2021).
Note: Last record is June 2021. An increase reflects tightening.

Figure 2
Snapshot of the yield curve
(percentage points per year)



Source: EIB estimates based on Refinitiv, a provider of financial market data.
Note: Snapshots of the euro overnight index swaps curve at various dates. The maturity in years is indicated on the x-axis.

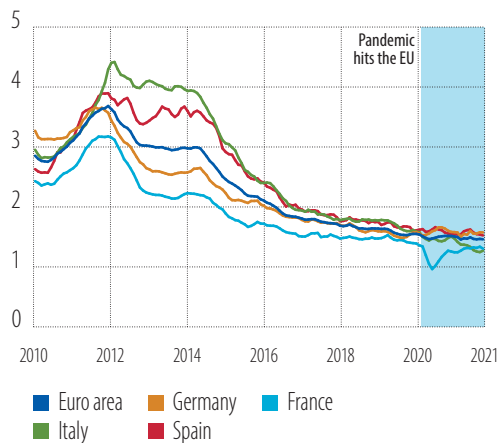
In the European Union, a further rise in bond yields cannot be ruled out, but it should remain contained as asset purchase programmes are gradually wound down. Short-term rates should remain at ultra-low levels until 2023, when the ECB could start raising rates, according to market expectations. The ECB's pandemic emergency purchase programme may well be phased out in the first half of 2022, possibly resulting in a steepening of the curve at its long end (longer maturities). The change should, however, remain limited, and it shouldn't spell the end of low interest rates.

The low cost of finance increases firms' ability to withstand shocks. Figure 3 shows trends in the cost of bank borrowing for firms in the euro area. Given the prominent role of bank finance, the rates charged by banks have a major impact on external financing costs. The cost of bank borrowing has remained almost unchanged since the start of the COVID-19 crisis, lingering at very low levels. Moreover, in contrast to the sovereign debt crisis, the spread between the cost of finance for firms in the more vulnerable countries, where public indebtedness is higher, and those in other countries has not increased. The same is true for risk spreads, with the exception of the very first months of the crisis, when they escalated before being compressed by the ECB's policy response.

In contrast to previous crises, the spread in rates charged for different types of loans has not widened. Borrowing costs for small loans, a good proxy for lending to small and medium-sized enterprises (SMEs), have continued to fall in recent months, in particular for short- and medium-term maturities. In the six

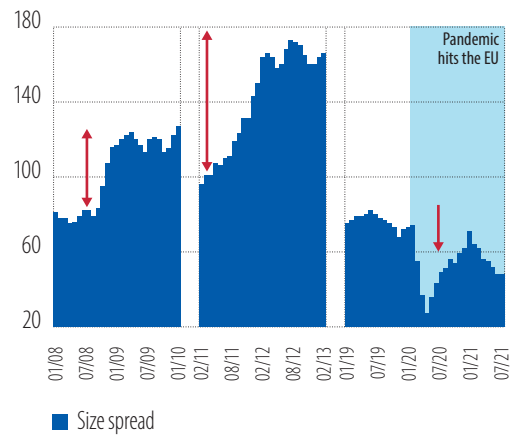
months before June 2020, these borrowing costs declined to record lows and the spread with large loans remained narrow. As shown in Figure 4, the reaction contrasts sharply with the global financial and sovereign debt crises.

Figure 3
Cost of corporate bank borrowing
(percentage points per year)



Source: EIB estimates based on Refinitiv.
Note: Last record is October 2021.

Figure 4
Rate spreads during economic crises
(from left to right: the global financial crisis, sovereign debt crisis and COVID-19, in basis points)



Source: EIB estimates based on the ECB.
Note: The difference between the cost of borrowing on small loans (below EUR 250 000) and large loans (above EUR 1 million) is expressed in basis points. New business volumes. The last record is October 2021.

Backed by government guarantee programmes, firms have borrowed at low costs. Figure 5 clearly shows the rise in cash and deposits as a percentage of gross domestic product (GDP) in the European Union. Following the global financial crisis, firms reduced their holdings of cash and liquid assets by about 2% compared to before the crisis. Since the beginning of this crisis, bank lending to EU firms has increased by 4%, which has swollen firms' cash holdings (Figure 5). The reimbursement of short-term debt is likely to be accompanied by a decrease in those holdings.

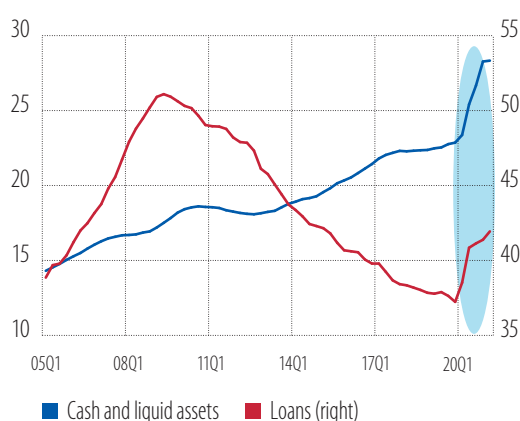
After a boom at the start of the crisis, corporate debt issuance has remained steady (Figure 5). While a similar trend was recorded during the sovereign debt crisis, the reasons are different. Andersson et al. (2021) show that during the previous crisis, debt was issued by large corporations to bypass the bottlenecks that prevented them from accessing bank loans. This time, however, debt was backed by government guarantees and issued as a form of insurance to ensure firms had the liquidity they needed to wait out lockdowns. Gonzalez (2021) points to other differences, such as the larger issuance of high-yield bonds during the COVID-19 crisis and the different industries issuing debt.

Fewer firms face difficulties accessing credit than before the crisis, illustrating that the availability of finance is not a major issue. After increasing in the first year of the crisis — from 4.9% in 2019 to 5.6% in 2020 — the share of finance-constrained firms decreased to 4.7% in 2021, below pre-crisis levels and the lowest level recorded in the history of the EIBIS.

Investment financing conditions are uneven, with easing in Western and Northern Europe and Central and Eastern Europe, but tightening in Southern Europe. In Figure 6, we correlate two results from the EIBIS: the financial constraints indicator and the willingness to use internal financing. Financial constraints are likely to impact investment when firms are less dependent on outside funds. The top or the left of Figure 6 therefore shows that investment financing conditions have improved. In 2021, the

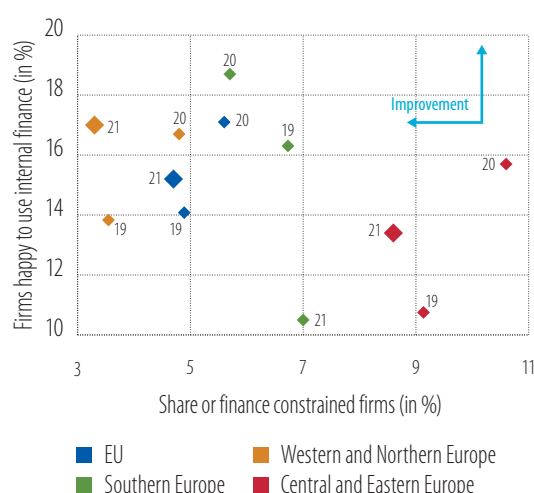
credit conditions eased in Central and Eastern Europe, but they nonetheless remain structurally tighter. Western and Northern Europe show improvement, and the region continues to have some of the best credit conditions. In 2021, however, firms in Southern Europe saw credit tighten. Their willingness to rely on internal financing declined and the share of finance-constrained firms increased.

Figure 5
Loans, debt and cash position of firms
(EU firms, % GDP)



Source: EIB estimates based on Eurostat.
Note: The latest record is the first quarter of 2021. Four quarter moving average.

Figure 6
Share of credit constrained firms by country vs. share of firms that could rely on internal financing



Source: EIBIS, 2019-2021.
Note: The numbers indicate the year.

Employment support policies and profit trends

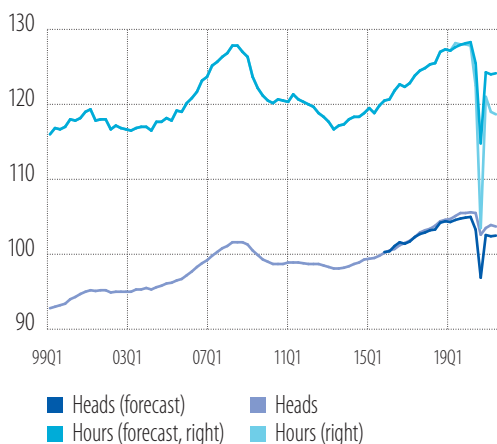
Employment support policies, in the form of widespread furlough schemes, enabled firms to hold on to their employees. Contrary to the United States and previous crises, the reduction in employment in Europe mostly involved cuts to the number of hours worked. Consequently, the unemployment rate rose less and the number of hours worked declined more than during past crises because companies were able to adjust their workforce through furlough schemes. While EU GDP fell 6%, the unemployment rate only rose by 1.2 percentage points in the first year of the crisis. In the first year of the global financial crisis, it increased by 2 percentage points, while GDP contracted much less.

Without government schemes to support the labour market, the number of hours worked would have declined 10% less, but the drop in employment per head would have been 5% greater. In Figure 7, we isolate employment and hours worked. These data are available over a long period, so that single error corrector models can be estimated. In the model estimated, employment adjusts to a long-term trend determined by productivity and real value added by firms. The models perform very well over the estimation period. The models are then used out of sample to predict trends from the fourth quarter of 2019 onward. As shown in Figure 7, historical patterns suggest that employment should have declined by more, and employment per hours worked by less. The policy for supporting employment protected jobs and avoided the long-term effects of laying off employees. In terms of costs, the policy increased the elasticity of costs to activity by 50%.

As expected, the share of profitable companies fell sharply in 2020, with smaller firms suffering more. Figure 8 reports the share of profitable companies surveyed in the EIBIS. In normal times, when economic output grows at around its potential, approximately 77% of European companies are profitable, and the number is usually around 3% higher for larger firms than for small and medium firms. During the first year of the COVID-19 crisis, the share of profitable companies fell by 10 percentage points for small and medium firms and 6 percentage points for larger firms.

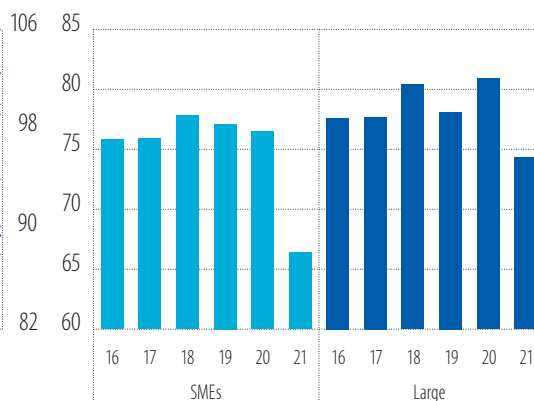
While corporate profits have fallen substantially, they declined less than sales because government support dampened the impact of lower sales on profits. In the first four quarters of the global financial crisis, corporate real value added in the European Union fell by 4.2%, and the share of corporate profits¹ receded by 2.4 percentage points (third quarter of 2008–second quarter of 2009 vs. fourth quarter of 2007–third quarter of 2008). Compared with 2019, real value added fell by 5.9% in 2020, about 1.5 times more than during the global financial crisis, while the share of profits declined less, contracting 1.6 percentage points. Applying the same elasticity as during the global financial crisis, the decline in the share of profits should have been twice as great — a contraction of 3.2 percentage points.

Figure 7
Actual employment and the counterfactual simulation (2015=100)



Source: EIB estimates based on Eurostat.
Note: The dark-coloured line indicates actual developments. The light-coloured line indicates a counterfactual simulation based on a single error corrector model.

Figure 8
Share of profitable firms (in %)



Source: EIBIS, 2016-2021.

Corporate investment

Bank lending has continued, but it has not fuelled capital expenditure. The ECB Bank Lending Survey contains a question regarding demand for loans. The responses indicate that inventories and working capital drove the surge in demand for bank credit in 2020. At the same time, corporate investment was lower and therefore demand for loans to fund projects was also lower. The reduced demand for capital acted as a drag on demand for credit and continued to do so until the second quarter of 2021, at least.

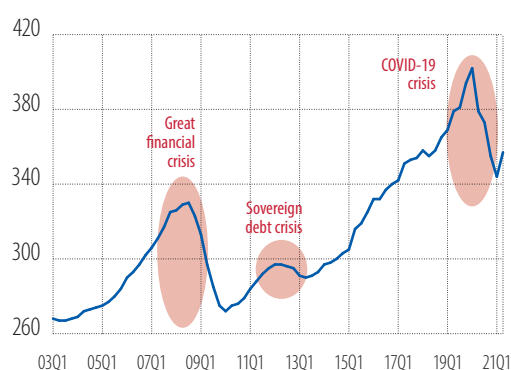
While support has placed a massive strain on public finances, it did prevent a full blown liquidity crisis. The public sector stepped in to prevent an economic shock from feeding through to corporate and household finances and triggering a recession. As discussed in Chapter 1, these policies resulted in sharp increases in public debt in advanced economies. Arena et al. (2021) show how financial support for firms and households has shifted the burden to the public sector.

¹ Measured as entrepreneurial income over gross value added for non-financial firms.

Corporate investment was responsible for the fall in total investment, and it has started to recover. At the low-point of the crisis, total investment in real terms dipped to levels seen 12 years earlier, before the global financial crisis in 2008. In real terms, annual flows in corporate investment were 20% higher in the fourth quarter of 2019 than in the third quarter of 2008, before the great financial crisis. In the first quarter of 2021, corporate investment was only 5% higher (Figure 9). Meanwhile, public and household investment have remained almost unchanged during the crisis. Corporate investment has started to recover, but by the second quarter of 2021, annual flows were still 11% below their level in the fourth quarter of 2019.

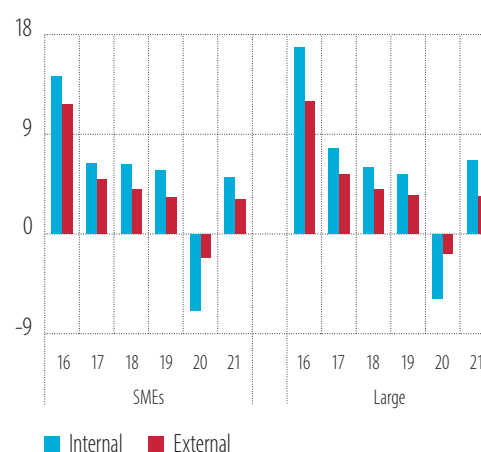
In nominal terms, corporate investment has fallen to the same extent as during the global financial crisis, even though the fall in GDP was much bigger. Since the start of the crisis, corporate investment has declined by EUR 166 billion annually. During the global financial crisis, it fell by almost the same amount, EUR 164 billion, which was a larger drop relative to GDP at the time. The decline during pandemic was also smaller than anticipated, reflecting the effectiveness of strong policy support (Box A).

Figure 9
Real corporate investment
(2005 euros in billions)



Source: EIB estimates based on Eurostat data.
Note: The most recent record, for the second quarter of 2021, was partially estimated. Four-quarter moving average of non-seasonally adjusted data.

Figure 10
Expectations of internal and external
financing conditions (% of respondents)



Source: EIBIS, 2016-2021.
Note: Net balance of replies, improvement vs. deterioration.

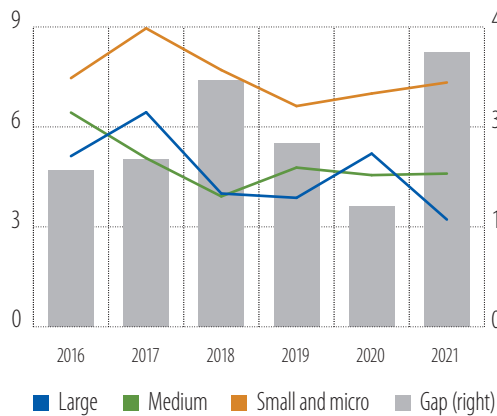
In the EIBIS 2021, firms report that their financial resources were improving. Figure 10 shows that in the current financial year, the net balance between firms expecting an improvement and those expecting a deterioration is clearly tilted towards an improvement. This comes after a sharp deterioration during the first year of the COVID-19 crisis.

Firms' are shoring up internal resources more than taking on external finance, but they still haven't made up for the damage done by the pandemic. While government policies bolstered firm's profits through direct subsidies or furlough schemes, the support did not fully offset the fall in demand or the drop in sales. Internal finances therefore deteriorated much more than external finance. The rebound in internal financing is sharp but does not fully cancel out the deterioration recorded last year.

Smaller firms are experiencing more financial constraints. Figure 11 shows overall financial constraints by firm size. Small and micro enterprises are more likely to face such constraints. The financial gap between large and small firms varies over time. It was at its highest in 2021, when 6.1% of small and medium businesses reported financial constraints, compared with only 3.2% of large firms. The profits of small and medium firms have sunk more during the crisis (Gourinchas et al., 2020) with 50.3% of those

firms reporting that the pandemic negatively affected sales. A lower share of large firms are experiencing such constraints (47.2%). The latest SME barometer shows that micro and small firms have lagged behind medium ones in the recovery over the last half-year (SME United, 2021).

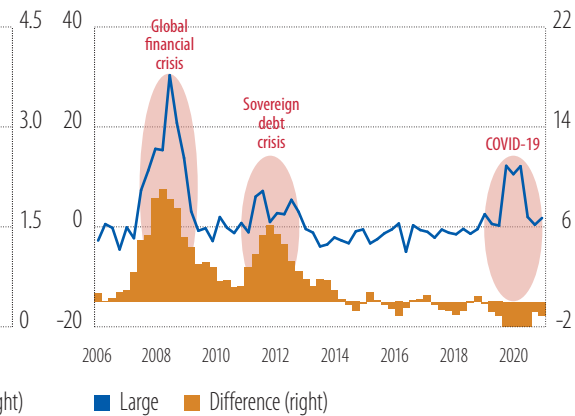
Figure 11
Firms facing financial constraints (in %),
by year and size



Source: EIBIS, 2016-2021.

Note: The gap reports the difference between the proportion of small and micro firms that are financed-constrained and that of large firms.

Figure 12
Credit standards on corporate loans (index)



Source: EIB estimates based on the ECB Bank Lending Survey October 2021.

Note: An increase reflects a tightening in credit standards. Net balance of banks reporting a tightening and those reporting a softening, in %.

Government loan guarantees helped to keep credit affordable for firms, but a possible rise in non-performing loans could cause credit to tighten (Figure 12). According to the ECB's Bank Lending Survey for July 2021, credit conditions remain favourable for firms. The impact of the end of state guarantee programmes is very uncertain. In the previous economic upturn, non-performing loans declined in most European countries, but they are still a source of concern. At the start of the crisis, banks reported that an increase in non-performing loans was adversely affecting the terms and conditions for all types of loans.

Box A

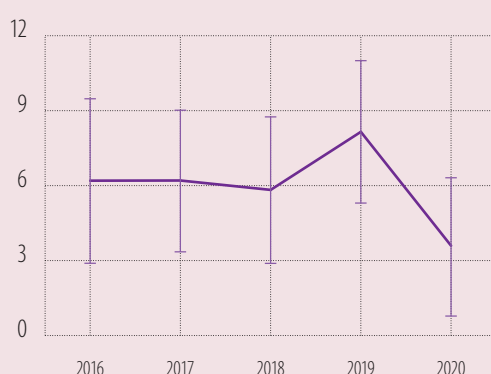
High-growth enterprises during the crisis

This box delves into the crisis's impact on high-growth enterprises. It shows that these enterprises have reduced their investment plans by more than other firms, but are also more optimistic regarding their internal financing. In the long term, they are less likely to reduce staff permanently and more likely to digitalise compared to other firms.

During the COVID-19 crisis, high-growth enterprises have revised their investment plans downwards more, aligning them with other firms. From 2020 to 2021, the share of high-growth enterprises expecting to invest more in the current financial year dropped by 14 percentage points, which is 4 percentage points steeper than the decline for other firms. Coad et al. (2021) use difference-in-differences methodology to analyse the change in the responses of these enterprises during the COVID-19 crisis. The results depicted in Figure A.1 suggest that high-growth investors adopted a more cautious attitude during the crisis and were less likely to have optimistic investment plans compared to peers.

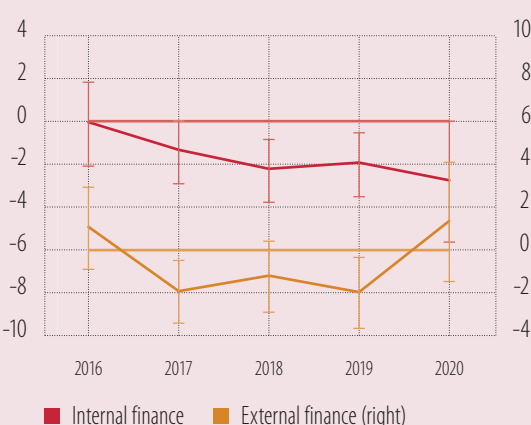
Over the period, high-growth enterprises remained more optimistic about their internal financing. In general, the EIBIS suggests that high-growth enterprises are also more optimistic about their ability to find external finance. They are less likely to expect a deterioration in their cash flow. A possible explanation could be the strong expansion of these enterprises, with strong sales growth generating greater cash flows. As shown in Figure A.2, the internal financing of high-growth enterprises does not seem to be more affected than other firms. Despite the hit firms took to their internal cash flow during the crisis, high-growth enterprises continued to maintain a more optimistic view of the future. The difference remains significant.

Figure A.1
High-growth firms' relative optimism about expected investment (in percentage points)



Source: Estimates based on ORBIS–EIBIS matched database.
Note: See Coad et al. (2021). The higher the coefficient, the more optimistic the high-growth firms are compared to other firms. The vertical lines portray the 95% confidence interval.

Figure A.2
Deterioration in high-growth firms financing capacity (in percentage points)



Source: Estimate based on ORBIS–EIBIS matched database. See Coad et al. (2021). A lower number indicates that high-growth firms are relatively less likely to report a deterioration. The vertical lines portray the 95% confidence interval.

Nevertheless, high-growth enterprises have gotten more pessimistic regarding their external financing conditions. Figure A.3 shows that high-growth enterprises tend to be more optimistic regarding external finance. However, the difference is not always statistically significant at 5%. During the crisis, these enterprises shifted from relative optimism to relative pessimism. The shift was significant but not that different compared to other firms.

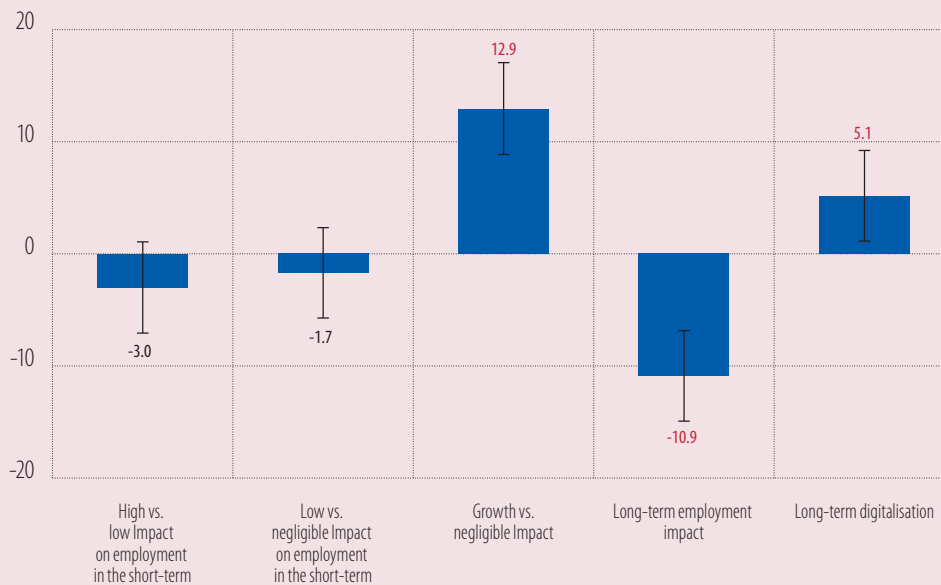
In the short term, high-growth firms do not have a higher probability of reducing their workforce. Figure A.3 shows the difference between high-growth firms and others regarding the impact of the COVID-19 crisis. The data in the figures are estimated by Teruel et al. (2021) with probit regressions controlling for country, sector, and firm characteristics. High-growth enterprises are more likely to increase their workforce in the short term compared to other firms, suggesting that high-growth firms are adjusting fast and benefiting from new demand created by the crisis. However, the coefficients are not statistically significant.

In the longer term, high-growth enterprises are less likely to reduce employment permanently, but they are more likely to digitalise and therefore need new kinds of employees, those with more digital skills. Figure A.3 also depicts the impact of COVID-19 in the long term. Interestingly, high-growth

enterprises show a lower probability of reducing their workforce permanently in the long term because of the pandemic. Additionally, Figure A.3 presents the impact on the expected probability of digitalising in the long term because of the pandemic. The results show that these enterprises are more likely to increase their digitalisation in the long term.

Figure A.3

Estimated impact of being a high-growth firm on employment, growth and digitalisation (in percentage points, lower numbers means less likely)



Source: Teruel et al. (2021).

Note: Based on probit regressions controlling for age, country and sector, number of employees, and being a subsidiary. Bold red numbers represent statistically significant coefficients (at 5%). The first three bars refer to the short-term adjustment to their workforce because of COVID-19, while the last two bars refer to the long-term impact.

Vulnerability and asymmetry

The economic effects of the pandemic are increasingly uneven, partly because subsequent lockdowns have been more selective. Because the economies of EU members differ in the size of firms and in the importance of different industries, the overall impact of the pandemic varies widely. Bankruptcies have been surprisingly low so far, but they could rise in the next few years. The risk is that pockets of vulnerable firms remain. Differences in the swiftness of insolvency procedures in various EU countries mean that an increase in bankruptcies could still jeopardise the recovery. These potential legacies from the crisis would pose a threat to a European Union-wide recovery.

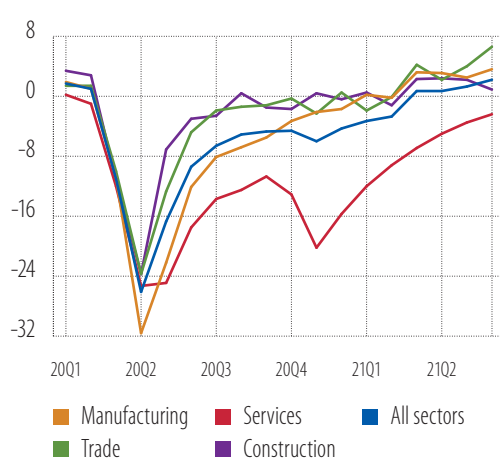
Sales losses across firms

The COVID-19 crisis caused sales to plummet as much as 30%. The trough reached in May 2020 was comparable across the four major sectors of the economy portrayed in Figure 13, reflecting the indiscriminate nature of the first lockdown. As lockdown policies became more selective, the recovery started to be uneven. Trade and construction almost returned to pre-crisis levels in the third quarter of 2020, while sales for services were still 12% lower. In the second quarter of 2021, services were the only

sector not to have returned to its pre-crisis level, with a gap of around 5%. A more detailed breakdown is needed because the sub-sectors of services have been affected very differently.

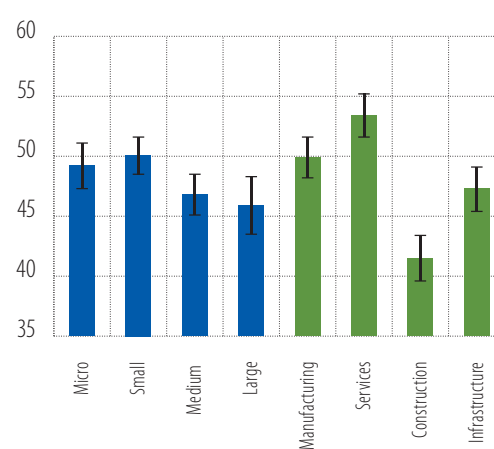
The sales decline has been uneven across firms. Figure 14 reports the impact of certain firm characteristics on the likelihood of record sales losses. Using a probit model, the occurrence of sales losses being recorded, as reported in EIBIS 2021, is projected based on certain firm characteristics, after controlling for the country. Some firm characteristics seem to have an impact on the probability of experiencing sales decline, while others do not.

Figure 13
Sales trends in four main sectors
(% deviation from pre-crisis level)



Source: EIB calculations based on Eurostat.
Note: Monthly data, seasonally adjusted. The last record is June 2021.

Figure 14
Corporate sales losses, using size and sector
as important factors (probit estimate in %)



Source: EIB estimates based on EIBIS 2021.
Note: Probit models controlling for the country are used. The thick bar reports the impact of each characteristic on the probability of recording sale losses. The thin lines report the 95% interval surrounding this impact.

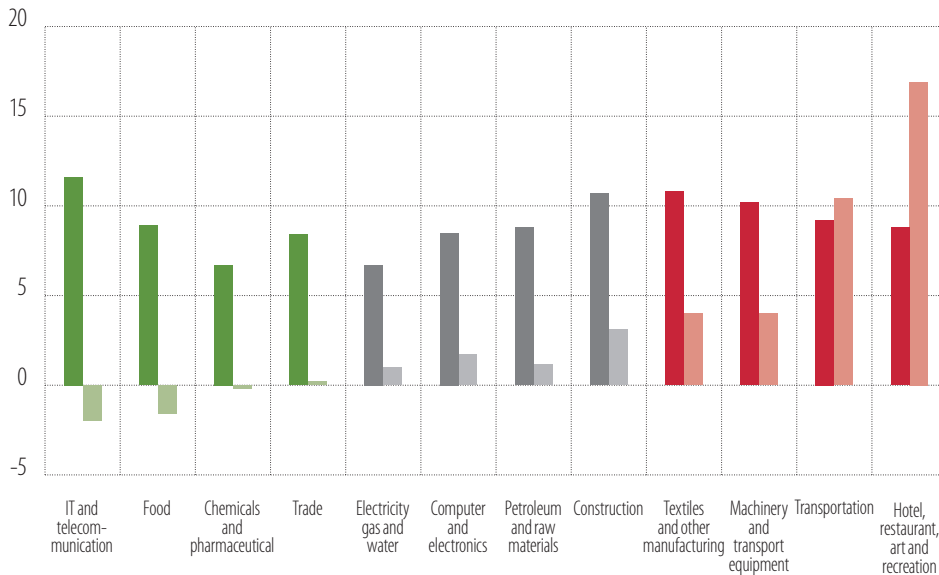
Sector and size appear to be key factors affecting sales. Figure 14 shows how the probability of recording a decline in sales changes depending on the sector. Firms operating in services are most affected, while construction firms are less affected. Micro and smaller firms were most likely to lose sales. According to EIBIS 2021, 50.3% of small and medium businesses reported that the COVID-19 crisis had a negative impact on sales, more than 3 percentage points above the share of large firms (47.2%). During the first year of the COVID-19 crisis, 19.5% of small and medium businesses saw sales drop, more than 1 percentage point above the share of large enterprises (18.4%).

In the absence of firm-level data for the full period, we have estimated firms' profits for the first two years of the crisis to assess the impact on various sectors. When sales contract, firms cut their spending, mainly by reducing their consumption of supplies and by laying off staff. However, costs do not fully react to changes in sales in the short-to-medium term for various reasons, and profits are procyclical. We have estimated the cost elasticity specific to 12 separate sectors and simulated the impact of a specific change in sales.² The shock to sales is based on the decline in turnover observed on Eurostat from the beginning of 2020 to the end of June 2021. To account for the widespread use of furlough schemes, we have increased labour elasticity by 50% compared to the historical basis. Forbearance³ is also considered by suspending the payment of financial costs in 2020.

² We use the EIBIS-ORBIS matched dataset, which comprises more than 45 000 European firms. Changes in profits correspond to changes in sales minus changes in costs. Costs are broken down into the four main items: employee costs, material costs, financial costs and other costs. $\Delta\text{Costs} = \alpha\Delta\text{Sales}$, with $0 < \alpha < 1$. See Maurin and Pal (2020).

³ A special agreement between the lender and the borrower to delay the payments of debt obligations.

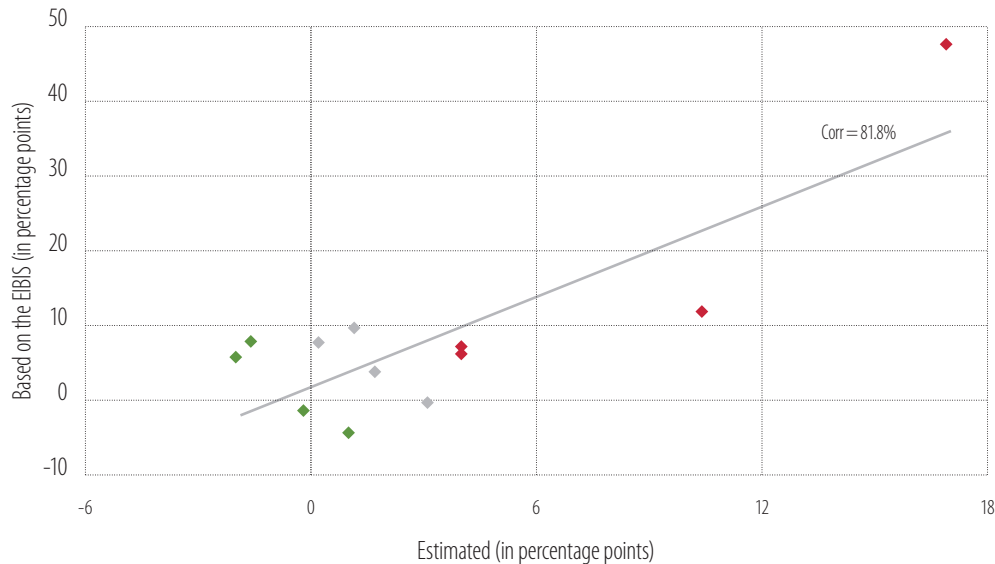
Figure 15
Firms (in %) recording losses vs. normal times



Source: EIB estimates based on EIBIS-ORBIS historical matched database and Eurostat sales statistics.

Note: EU results, see Maurin and Pal (2020 and 2021). The dark-coloured bars indicate the percentage of firms recording losses in the sector in normal times. The light-coloured bars indicate the estimated change in the share of firms recording losses during the COVID-19 crisis. Red, grey and green indicate the sectors experiencing the greatest, median or lowest impact.

Figure 16
Estimated and reported change in the share of firms recording losses



Source: EIB estimates and EIBIS 2021.

Note: The estimated changes are those reported in Figure 15. Red, grey and green indicate the sectors experiencing the greatest, median or lowest impact.

During the crisis, the share of firms reporting losses increased from 9% to 13%. Figure 15 plots the share of firms recording losses before the COVID-19 crisis along with the estimated change from 2020 to 2021, which covers both the collapse in activity and the start of the recovery. In normal times, a significant share of firms lose money, ranging from 6% to 12% depending on the sector. Interestingly, no correlation is identified between the pre-COVID-19 share of firms posting losses and the size of the increase in sector vulnerability. Also, while most sectors have seen an increase in the share of firms that lost money, some, such as IT and telecommunications, or chemicals and pharmaceuticals, have actually shown a decrease in the share of firms reporting losses.

It is becoming clear that the crisis's impact was uneven. Along with transport, hotels and restaurants were the worst hit, with the share of firms losing money more than doubling during the crisis. On the other hand, IT and telecommunications, food, chemicals and pharmaceuticals were the least affected, with a lower share of firms reporting losses than normally. In Figure 15, the sectors are ranked according to the increase in the share of firms losing money. The most affected sectors are at the top, and the least affected ones at the bottom. The 12 sectors considered are grouped into three categories, with the least affected in green, those in the median range in grey, and the most affected in red.

The estimates correlate well with the results obtained from the EIBIS. For each sector, Figure 16 correlates the profit simulation with the answer received from the EIBIS, where a specific question asks firms if they have lost money in the current financial year. The elevated correlation suggests that the estimates track the differences among sectors well.

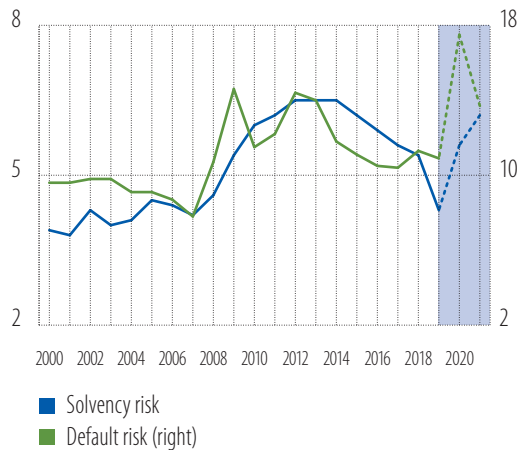
Increased vulnerability

We have built a vulnerability indicator based on solvency and default risks. We linked the estimated trends in firms' profits to financial and balance sheet characteristics. We then derived the implied interest rate coverage ratio (which measures how well companies can pay the interest on their debt) and the change in equity implied by the simulated profits. Next we compiled two indicators. The first is a default risk indicator that represents the proportion of firms with an interest rate coverage ratio below one, suggesting that their post COVID-19 net revenues are not sufficient to cover their financial costs. The second is a solvency risk indicator, with firms considered at risk if their losses wipe out their equity base.

Lower profits reduce a firm's capacity to repay its debt, and therefore increase its risk of defaulting. Figure 17 shows the proportion of firms at risk of defaulting (the share of firms whose interest coverage ratio is below one). The proportion is shown over time, starting with the beginning of 2000, with estimates used for 2020 and 2021 (information on firms' balance sheets is still scarce for those years). Before 2020, the proportion is derived from a simple calculation based on the financial statements. In normal times, when GDP is around its potential, 10% of EU firms do not earn enough to pay their financial costs. The proportion increased to 16% during the global financial and sovereign debt crises, before falling back to normal until the start of the COVID-19 crisis. The share of EU firms unable to pay their financial costs increased sharply to 18% in 2020, before receding to 16% in 2021 when demand partly returned to normal.

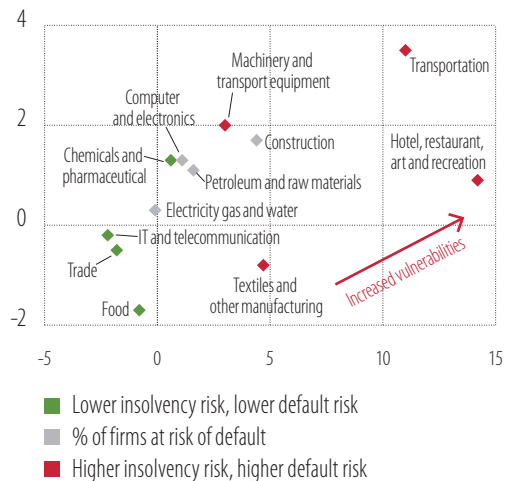
Higher losses also imply higher insolvency risks, and more firms with depleted capital. Figure 17 shows the trend in the proportion of firms in negative equity since 2000. A small share of firms are always technically insolvent. The ratio was below 5% prior to the global financial crisis, slightly decreasing as the economy strengthened. The global financial and sovereign debt crises pushed the share up to around 7%. Interestingly, the share of firms at risk of insolvency took several years to fall back to pre-crisis levels, showing that the impact was more sustained than on the risk of default. During the COVID-19 crisis, insolvency risks have been more contained, but also more persistent, with risks growing in 2021. Profits improved, and fewer firms lost money. But while some firms have returned to profit, others are continuing to lose money, so that for them, the equity base continues to shrink overall.

Figure 17
Corporate risk indicators: historical perspective (% of firms at risk)



Source: EIB estimate based on the EIBIS.
Note: See Maurin and Pal (2021).

Figure 18
Insolvency and default risks: a sector-based view (deviation in 2021 from the pre-crisis average, measured in percentage points)



Source: EIB estimate based on EIBIS-ORBIS matched database.
Note: See Maurin and Pal (2021). The colour code is identical to that used in Figure 15. It is based on the estimated increase in the share of firms recording losses.

The two risk metrics provide an indication of sectors' vulnerability, and confirm that sectors were affected differently by COVID-19. Figure 18 shows the two risk indicators in 2021, with a deviation from the average witnessed from 2000 to 2019. The two dimensions are clearly correlated, although the same profit forecasts are linked to different balance sheet or financial characteristics. Figure 18 shows that the increase in risks has varied by sector.

During the crisis, public support shielded firms from short-term liquidity problems, but the fall in profits and the rise in debt have driven up the share of vulnerable firms. Blanco et al. (2020) simulated the impact of the COVID-19 crisis on firms in Spain. Their simulations show that the crisis significantly increased firms' liquidity needs in 2020. The rise is more pronounced among small and medium businesses and among sectors hardest hit by the pandemic. The results also suggest that the proportion of firms whose existence is threatened by persistent losses through 2023 would rise 2 to 3 percentage points. Likewise, the proportion of firms that will remain viable but will struggle to repay their debts is expected to rise by 3 to 4.7 percentage points.

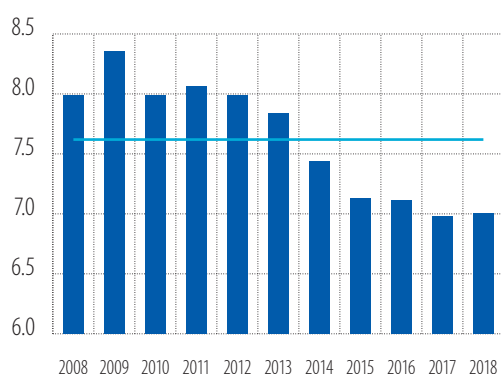
The percentage of firms going bankrupt is countercyclical and lags behind economic activity. Under normal economic conditions — when GDP is around its potential — 10% of firms typically record losses above the book value of their equity base, thereby becoming technically insolvent.⁴ While those companies are at a very high risk of insolvency, they can continue operating if they are able to tap into sufficient sources of new external financing, which depends on whether they can show financiers that their business is sustainable.⁵ Each year, on average, around 7.6% of EU firms stop operating (Figure 19).⁶ The ratio fluctuates with economic activity: more firms go bankrupt after a period of weak economic activity, and the converse also holds true. When the EU economy goes through periods of recovery, the rate of firms ceasing to operate declines, with some lags.

4 By definition, a corporation is technically insolvent if it has zero or negative equity. Nevertheless, a technically insolvent corporation might be still able to fulfil its payment obligations.

5 The new financing source can take the form of a new equity injection, bank loans, intra-trade credit or debt securities.

6 Bankruptcy is the main reason for exiting but not the only one. A more precise breakdown is not available at the EU level.

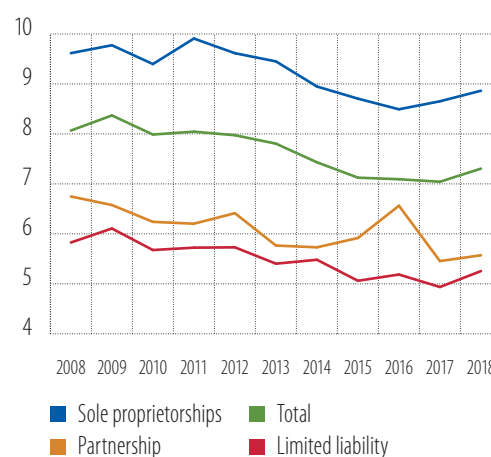
Figure 19
EU firms ceasing to operate (in %)



Source: EIB estimates based on Eurostat.

Note: The horizontal line reflects the historical average over the period.

Figure 20
Bankruptcies (% of EU firms), by firm size



Source: EIB estimates based on Eurostat.

The exit rate is higher and more cyclical for smaller firms. Figure 20 shows the movements in the exit rate (the rate of businesses ceasing to operate) across cohorts of firms. Over time, larger firms with a limited liability structure have a lower exit rate than smaller firms, such as partnerships. In turn, partnerships have a lower exit rate than sole proprietorships that tend to be the smallest firms. Econometric evidence also suggests that bankruptcies are more cyclical for smaller firms.⁷ As the structures of the countries' ecosystems differ in size and composition, bankruptcies may be higher in economies where more small firms operate. These differences could potentially lead to an uneven recovery among the various EU economies.

Taken together, all those elements suggest that the share of corporate bankruptcies might rise despite the recovery. Preliminary evidence points to a decline in bankruptcies in Europe since the start of the COVID-19 crisis. Debt moratoriums and the closure of courts in several jurisdictions during lockdowns may have created a backlog of insolvent firms.⁸ Estimates indicate that after the exceptional public support is withdrawn, up to 3% additional EU firms could stop operating. The increase in the ratio corresponds to about one-third to one-half the average share of firms exiting each year since 2008. The ratio is below the number of excess bankruptcies recorded between the onset of the global financial crisis and the start of the recovery from the sovereign debt crisis (Figure 19).

Inefficient insolvency regimes support zombie lending. Becker and Ivashina (2021) recall that bank lending to less productive firms at subsidised rates can help banks in the short run, but it can also deepen and prolong economic crises. The authors argue that inefficient mechanisms to deal with insolvency supports zombie lending (lending to firms that cannot repay). At the firm level, cheaper credit is more common in bad times because banks try to prevent clients from going bankrupt. Reforming insolvency regimes could therefore help contain zombie lending, along with increases in bank capital requirements and reinforced supervision.

The varying efficiency of insolvency regimes could further exacerbate differences in the recovery among firms and countries. Organising corporate exits takes longer in less efficient jurisdictions. This

⁷ Maurin and Pal (2021) estimate ordinary least squares (OLS) regressions explaining bankruptcy rates with lagged indicators of firm performance at the country level, such as gross value added. The response is stronger for smaller firms and for firms located in less efficient jurisdictions.

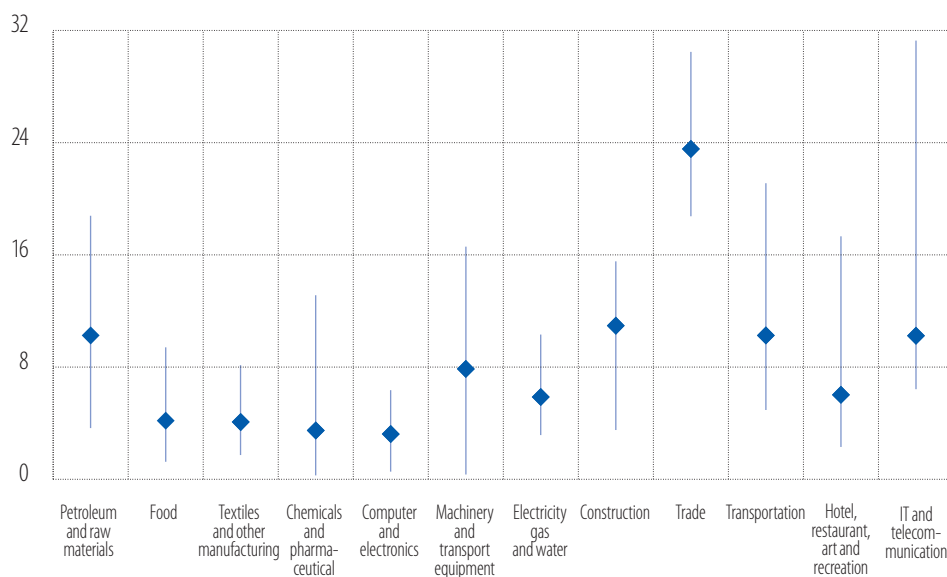
⁸ The European Banking Authority (EBA) suggests that 7.5% of the volume of overall loans have benefited from moratoriums, which automatically delays the effect of the crisis on firms. Filings for insolvency procedures have been suspended for a long period in most EU jurisdictions.

means that the possible rise in bankruptcy rates would happen at different times and to differing extents across the European Union. The reason is not just the uneven impact of the COVID-19 crisis on different members' economies, but also the wide variety in insolvency regimes and judicial capacity. According to World Bank data, an insolvency procedure in the European Union takes on average less than 1.5 years in countries representing 18% of EU GDP, from 1.5 to 2.5 years in countries representing 70% of EU GDP, and more than 2.5 years in countries representing 12% of EU GDP.⁹

Country exposure

The composition of economic sectors differs across EU members. As shown in Figure 21, the share of each of the 12 sectors considered varies widely within and across economies. For example, IT and telecommunications accounts for 6% to 7% of non-financial corporate value added in Latvia, Portugal and Greece, and more than 14% in Luxembourg, Sweden and Ireland. Hotels and restaurants account for less than 3% in Poland, Latvia and Denmark, and more than 13% in Croatia, Greece and Cyprus.

Figure 21
Sector shares in EU countries (in %)



Source: EIB estimates based on Eurostat.

Note: The dot reflects the average while the vertical line reflects the range in the share of each sector across the 27 EU economies.

⁹ Less than 1.5 years: Austria, Belgium, Cyprus, Denmark, Finland, Ireland, the Netherlands and Slovenia. 1.5-2.5 years: Czech Republic, France, Germany, Hungary, Italy, Latvia, Lithuania, Luxembourg, Spain and Sweden. More than 2.5 years: Bulgaria, Croatia, Greece, Malta, Poland, Portugal, Romania and Slovakia.

Figure 22
Expected GDP rebound and country exposure



Source: EIB estimates based on Eurostat, EIBIS-ORBIS database.

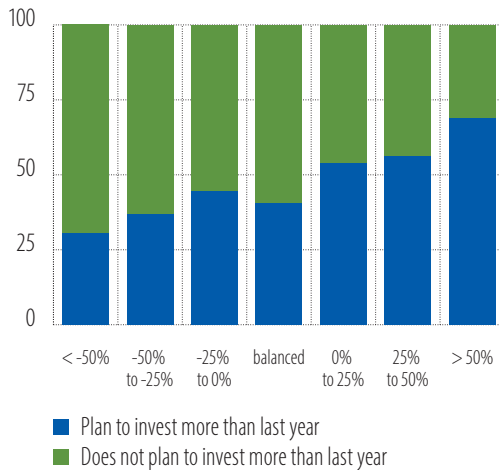
Note: The vulnerability indicator is obtained as the average of the default and solvency risks. Those risks are obtained as the average across the 12 sectors of the related risk estimated at the EU level.

The varying importance of sectors in EU members' economies heightens the risk of an uneven recovery, with countries in Southern Europe more at risk. In Figure 22, the y-axis shows the relative deviation in real GDP forecast in 2022 vs. 2019. On the x-axis, the vulnerability indicator shows the percentage of firms at risk, calculated as the sum of the average of the two risk indicators for each sector, weighted by that sector's contribution in each country. In all EU economies, real GDP is projected to surpass its pre-crisis level in 2022. Figure 22 shows that the lower cumulated GDP growth over three years is associated with greater increases in corporate vulnerability. Countries from the south, indicated in green, tend to be more affected. To some extent, this greater impact reflects their higher exposure to sectors that demand social interaction. Lockdowns hit those sectors harder.

Steeper sales losses are associated with a weaker rebound in investment. As explained in the first section, investment took a hit. The EIBIS also suggests that internal financing capacity is important. Figure 23 reflects the answers to the question on the change in the volume of investment planned for the current year compared to last year, depending on the sales decline. Between 28% and 68% of firms expect to raise investment. The share tends to increase with the change in sales. The worse the sales decline, the weaker the rebound in a firm's investment. This trend does not bode well for a rebalancing of investment, as the firms that saw a bigger sales decline also reduced their investment by more. Their tendency to raise investment more slowly suggests that they are focusing on repairing their balance sheets.

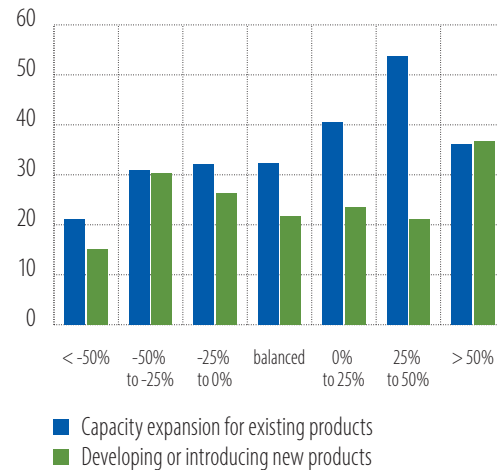
The nature of investment is also affected by the decline in sales. Figure 24 shows the results of the question on the type of investment foreseen in the next three years. As expected, the greater the decline in sales, the lower the investment in capacity expansion. The relationship differs for investment in developing new products. Firms that have been hit, but not hit the most, tend to invest more than firms that are marginally hit, not hit or hit more. Firms may have realised that their products and services are no longer suited to the post-COVID-19 world and need to take their offering in a new direction. Firms can change direction if the hit was contained. When the hit was major, they have little scope to adjust.

Figure 23
Firms (in %) planning to invest more this year



Source: EIB estimates based on EIBIS 2021.
Note: The x-axis indicates the change in sales.

Figure 24
Type of investment planned over the next three years (% of firms)



Source: EIB estimates based on EIBIS 2021.
Note: The x-axis indicates the change in sales in 2020.

Firm-level support

In the current crisis, firms have received massive direct public support from governments and the European Commission. Policy support has been vast and diverse, reaching companies weakened by the crisis. An overview of the literature on the impact of policy support is provided in Box B, confirming that the measures have played a major role in stabilising the economy and bank lending during the pandemic.

The EIBIS 2021 offers a unique source of data to assess how policy support has affected firms. We have used the information collected during the sixth EIB Investment Survey to analyse the nature of the support in detail. The EIBIS considers four types of support: (1) new subsidised or guaranteed credits (such as loans, overdrafts or credit cards from a bank or another 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) deferrals of payments which still leave a liability to be paid by the company in the future (for instance, deferral of tax payments, deferral of rents or mortgages on commercial property, or the 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 — job retention policies fall under this category; and (4) any other type of financial support.

Policy support for firms within and across economies

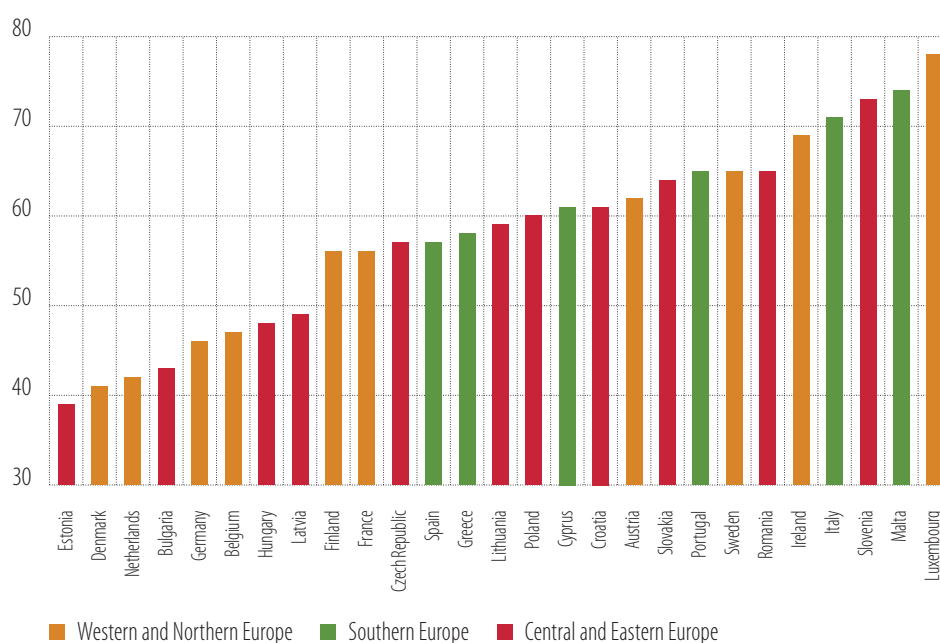
We are focusing on the policy support that was actually implemented. To take up policy support, firms needed to be both eligible and willing. The choice not to apply is likely indicative of certain firm characteristics or strategies. For example, France Stratégie (2021) shows that the take-up rate decreases with business size and that certain measures were not taken up systematically. It also shows that if a firm did not use the measures, it was probably because the firm chose not to do so. The EIBIS 2021 survey information does not enable us to determine whether a firm did not receive support because it was not eligible or because it did not want to participate.

Other factors besides eligibility influenced whether firms accepted support. The design of the programmes and how the administrative processes were set up are cited as explanations for the low take-up 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 also had a bearing on how guaranteed credit was allocated, as banks lent more in their core markets and where they have a larger local market share (Degryse and Ongena, 2005).

While the support measures implemented are relatively similar, comparing them across countries is still complicated due to a variety of factors. First, eligibility, the size of the support and the time frames differ substantially. Second, the volumes of financial support initially budgeted in the programmes differ from the amounts that were later disbursed. Third, the COVID-19 policy support measures coincide with other accommodating policies affecting the corporate sector, such as the recovery programme **NextGenerationEU**, the ECB's pandemic emergency purchase programme, national support programmes for households as well as automatic stabilisers (such as unemployment benefits and housing subsidies).

56% of firms received some kind of support. Figure 25 reports the share of companies that benefited from public support across the European Union. 56% of EU firms received support, with the rate varying from 78% in Luxembourg to 39% in Estonia. This ratio is somewhat lower in Southern Europe.

Figure 25
Intensity of policy support across European economies (% of firms)



Source: EIBIS 2021.

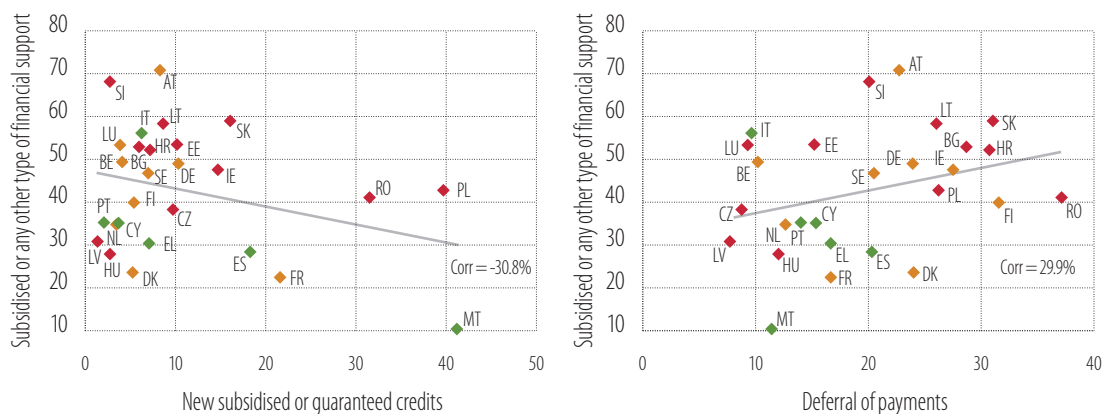
Note: Percent of firms having benefited from at least one type of support.

Most of the time, firms received one type of support, most likely subsidies (support for labour costs is included). Of all the types of policy support, subsidies (which include measures to bolster employment) were used the most, by 36% of firms in Western and Northern Europe, and in Central and Eastern Europe. Deferrals of payments and credit support represented almost the same share, coming to 16-17%. In some cases, companies benefited from two types of support (12% of EU firms overall), or even three (4%).

If combined with other types of support, payment deferrals tended to be used with other subsidies. Figure 26 plots the share of firms benefiting from two types of support by country. In the left panel, the

intensity of new subsidised or guaranteed credits (type 1) is correlated with the intensity of subsidies or any other type of financial support (type 3). The negative relationship suggests that these two types of policy do not tend to be used in combination with one another. In countries where firms benefit more from subsidies or any other type of financial support, these firms benefit less from new subsidised or guaranteed credits. The negative correlation amounts to -31%. Box B focuses on guarantee schemes and shows that the European Guarantee Fund has complemented the national programmes. In the right panel, deferrals of payments (type 2) are correlated with subsidies or any other type of financial support that does not need to be paid back (type 3). With a correlation of 30%, the allocation of both policies is positively linked; countries where firms benefit more from one policy also tend to benefit more from the other. This correlation suggests that most of the measures that fall under the category of subsidies or any other type of financial support (type 3) are likely to be labour support policies, as this support is associated with the deferral of social contributions or tax payments.

Figure 26
Relationship between types of policy support



Source: EIB estimates based on EIBIS 2021.

Box B

Recovery funds being allocated by governments and the European Guarantee Fund

As part of the policy response to the COVID-19 crisis, the euro area finance ministers agreed on 9 April 2020 to establish the European Guarantee Fund (EGF). The EGF was set up at the initiative of the EIB Group, which is also responsible for its management. EU members are expected to contribute up to €25 billion in guarantees. The fund is intended to provide additional financing to EU enterprises, particularly small and medium-sized businesses, to enable them to withstand the economic shock and to subsequently grow.

The fund provides financial support through guarantees and related risk-sharing products, as well as direct support channelled through instruments like venture debt and quasi-equity financing. The guarantees protect banks and their loan portfolios from losses on certain existing or new transactions. The guarantees therefore enable financial intermediaries to lend more money, which in turn facilitates firms' access to finance by reducing interest rates, providing loans with longer maturities or lowering collateral requirements. When the guarantees support new transactions, their role in supporting additional investment is fairly direct, sometimes by shifting risk from commercial banks or public

financial intermediaries to the EGF. For guarantees or counter guarantees on existing transactions or portfolios, the potential effect on investment is more indirect.

Extensions of national credit guarantee programmes

Various national credit guarantee programmes were already available in EU member countries, but the scope was often expanded during the pandemic and many new programmes were created, mostly around March 2020. Similar to previous major shocks that increased uncertainty, governments effectively took on the role of domestic guarantor of last resort. While the contours of that role differ across countries, a common feature is that governments provide support to firms through publicly supported credit guarantees. Publicly-supported guarantees for bank credit are one of the main types of policy used to respond to the COVID-19 shock.

The demand generated for any specific guarantee programme reflects its overall features and conditions and, obviously, the size of the total budget. National governments handle the standard trade-off between effectiveness and limiting moral hazard by building certain features into their programmes. Such features include eligibility criteria, coverage ratios, interest charges and guarantee fees. Table B.1 shows that the main features of national emergency credit guarantee programmes do not differ substantially across the four larger EU countries, even if there is some variation in coverage ratios, interest charges and fees (France *Stratégie*, 2021). The take-up of national programmes — in actual committed amounts — rose sharply from March 2020 to mid-2020 in all four countries. It then flattened, except for Italy where demand continued to grow (Bruegel, 2021).

Table B.1
Contours of emergency credit guarantee facilities in the four larger EU economies

	France	Germany	Italy	Spain
Body or programme (headline envelope)	Ministry of Economy and Finance, via Bpifrance (€300 billion)	Ministry of Economy and Finance (€460 billion) and KfW Sonderprogramm (€150 billion)	Fondo Centrale di Garanzia (€100 billion) and SACE export credit agency (€200 billion)	Instituto de Crédito Oficial (€144 billion)
Guarantee coverage rate	70-90%; Higher for small firms	80-100%	80-100%	80%
Maturity of loan	6 years	6 years; Alternatively 10 years for 100% cover	6 years; Alternatively 10 years for 100% cover	5 years
Interest rate on loan	0.25% first year, then 1-2.5%	3% for 100% cover; otherwise 1-2.1%	2% for 100% cover; otherwise market rate	NA
Guarantee fee	Charged to borrower	Charged to borrower	Subsidised	Charged to lender
Eligibility conditions	Non-financial corporates, with more restrictions and less favourable conditions applied in the case of larger firms (and separate programmes for exporting firms).			

Source: EIB staff estimates based on domestic websites and France *Stratégie*, 2021 and Bruegel, 2021.

Funds approved per country under the EGF

The EGF started operating in October 2020. At the end of August 2021, more than EUR 18 billion in EGF operations covering all 22 participating countries had been approved. Assessing the allocation of EGF funds to intermediaries or counterparts in participating countries can be done simply by comparing the amounts approved with the size of the initial shock in a given country. Here, the results of simple ordinary least squares (OLS) regressions shown in Table B.2 suggest that EGF demand per country is closely related to the size of the loss of GDP, and that more funds were disbursed in countries that

experienced a greater decline in GDP in 2020. Three different measures of the take-up of EGF funds are considered, as described in the notes below Table B.2. By contrast, the size of national guarantee budgets is not significantly related to any of the three measures considered here.

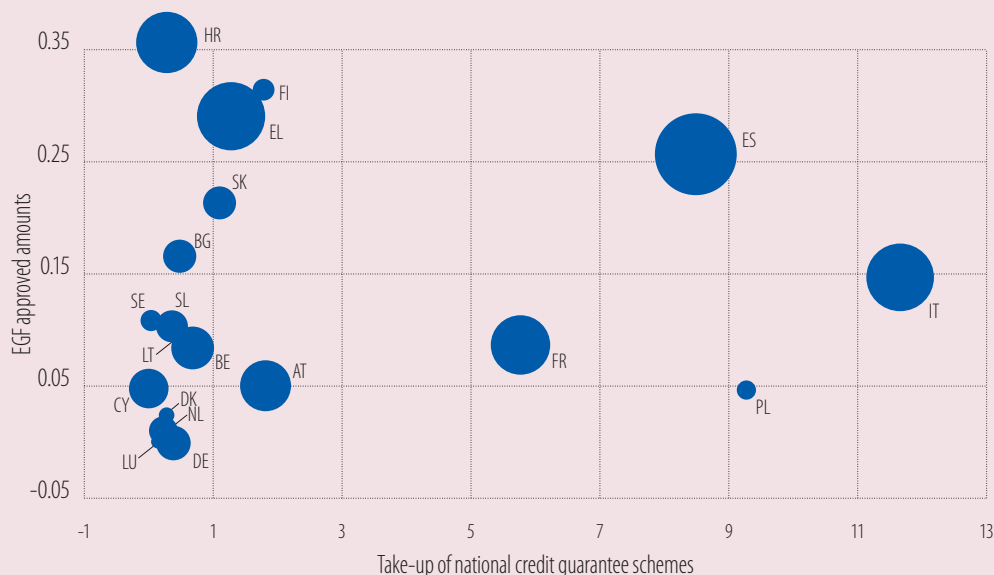
Table B.2
Determinants of the EGF rollout by country

	Total approved amounts (i)	Total approved amount involving some form of guarantee (ii)	Total approved amount involving some form of guarantee and a private counterparty (iii)
Take-up of national emergency credit guarantee	-0.003	-0.006	-0.005
GDP decline	-0.02*	-0.03**	-0.02**
Constant	0.08	0.07*	0.03
Number of observations	21	19	19
Adjusted R-squared	0.21	0.26	0.26

Source: EIB staff estimates based on data from the EIB, ESRB and Eurostat.

Note: Data at end-August 2021 for total approved EGF amounts (excluding multi-country deals) and at end-September 2021 for the take-up of national emergency credit guarantees. Explanatory variables expressed as a percentage of GDP. *significant at 10% level and ** at 5% level. EGF funds are analysed as follows: i) the total approved per country, ii) total approved amounts in the form of guarantees (capped and uncapped guarantees and linked risk-sharing), and iii) total take-up per country of measures including guarantees with private counterparties (excluding transactions with national development banks of public financial intermediaries). The results are robust to the inclusion of the total size of national guarantee budgets instead of their take-up.

Figure B.1
Rollout of funds under EGF and take-up of national emergency credit guarantee schemes



Source: EIB estimates based on data from the EIB, ESRB and Eurostat.

Note: Approved EGF amounts (excluding multi-country deals) as of August 2021 and take-up of national emergency credit guarantees as of September 2021, both as a percentage of domestic GDP. The size of the bubble reflects the annual percentage change decline in GDP in 2020 (with Ireland excluded for representational purposes here, as it did not register a decline in activity), based on the data for October from the 2021 Eurostat database.

Figure B.1 plots the rollout of EGF funds by country (expressed as a ratio to domestic GDP) against the take-up of national guarantee schemes (also expressed as a ratio to domestic GDP), with the size of the GDP decline in that country in 2020 illustrated by the size of the bubble. The chart shows that both the take-up of national credit guarantees and the rollout of funds under the EGF have been relatively high in Italy and Spain, whose output was hit particularly hard by the COVID-19 shock. The European Systemic Risk Board (2021) finds that the actual take-up of the announced national emergency credit guarantee budgets was higher in countries where the GDP shocks were more severe.

Overall, the analysis suggests that the country-specific allocation of funds under the EGF is largely related to the magnitude of the shock during the first year of the crisis. At this stage, it is difficult to determine the impact of these programmes, especially in the longer term. The programmes are part of broader policy frameworks that themselves reflect country-specific economic and financial conditions (Ebeke et al., 2021).

Support allocation across firms

A debate has emerged on the possible side-effects of public support, including the risk of misallocating resources. As support was mostly unconditional, some concerns have been raised that public funds might have been misallocated to keep afloat certain firms that would otherwise have ceased to operate, even if the crisis had never taken place. If funds have been misallocated, that misuse of those resources could weigh on long-term economic prospects (Archarya et al., 2020).

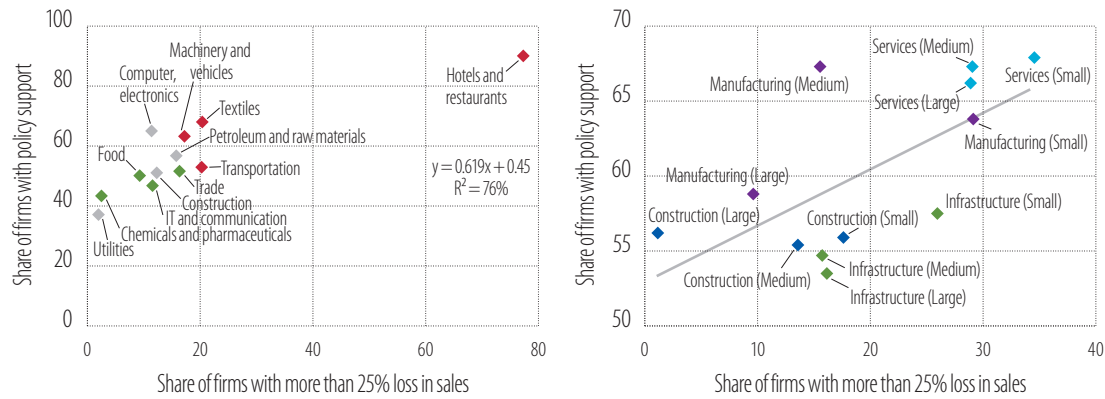
Public support was aimed at shielding firms, to prevent further pressure being put on demand. As such, this support was not designed to foster long-term growth. Public support was warranted because firms ran into difficulties due to government measures to restrict the spread of the virus, not because of fundamental issues with their businesses. Laeven et al. (2020) show that moral hazard is probably less of a problem than in earlier crises because many of the firms requiring short-term support were structurally healthy.

The massive public support deployed in Europe came after a long period of low rates, which favoured the survival of weak firms. Persistently low interest rates have probably facilitated the granting of new loans to borrowers on the verge of defaulting on their existing ones, contributing to the “zombification” of parts of the economy. Conversely, the environment might not have been very conducive for new, innovative competitors entering the market. Creative disruption has not taken place, and as a consequence, productivity growth has remained lacklustre.

No evidence has emerged of public support being misallocated across various industries. Figure 27 considers differences among sectors using two breakdowns (by sector and by firm size). In the left panel, we compare the share of firms receiving policy support against the share of firms posting large sales declines (of more than 25%) for 12 broad sectors.¹⁰ The panel confirms that services was one of the hardest hit areas, with hotels and restaurants suffering, while other sectors either were not affected or were positively affected. With a fairly accurate R-square reading of 76%, the positive relationship with the prevalence of policy support suggests that, across sectors, support was strongly linked to changes in revenue. The stronger the decline in sales in a sector, the higher the intensity of public support. When the types of public support are investigated separately, subsidies or other financial support (type 3) are strongly related to sales declines. A common type of public support is furlough schemes, which helped offset lost sales.

¹⁰ While the EIBIS sampling is not designed to be representative of these 12 sectors, each is populated by at least 350 firms throughout the European Union.

Figure 27
Policy support allocation (% of firms)



Source: EIB estimates based on EIBIS 2021.

Note: Any type of policy support. In the left panel, the colour (green, grey and red) refers to the sub-sectors experiencing the most positive, the median, and the most negative effects.

Smaller firms recorded steeper sales declines and therefore received more support. The four-sector breakdown used in the EIBIS (construction, manufacturing, services and infrastructure) is further analysed by firm size (small, medium or large) in the right-hand panel of Figure 27. For each of the four sectors considered separately, smaller firms were more affected, which is confirmed in the literature (Gourinchas et al., 2021). They are positioned to the right of their peers in the same sector as they are more likely to have seen significant sales declines compared to large firms: 29% vs. 9% in the manufacturing sector, 35% vs. 29% in the services sector, 18% vs. 1% in the construction sector, and 26% vs. 16% in the infrastructure sector. Consequently, small firms are also more likely to receive support, as shown by their position above their peers in the same sector.

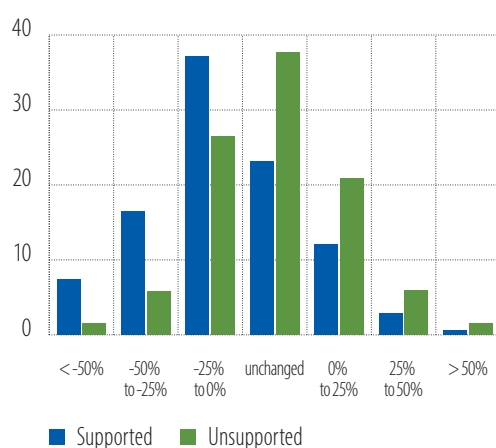
Overall, support went mainly to firms booking steeper sales losses. Figure 28 shows the distribution of the change in sales for firms that received support and those that did not. The distributions clearly differ. The distribution of firms receiving support is clearly tilted to the left, showing that on average, their sales losses were greater. The mode of the distribution corresponds to a decline of 0 to 25% while the mode for unsupported firms is around 0. One-quarter of the supported firms recorded sales declines of more than 25%, compared to 7% for unsupported firms. However, Figure 28 also shows that 15% of the supported firms recorded sales growth, while 9% of the unsupported firms recorded sales losses.

The type of policy support also matters. The link between a firm's drop in sales and the policy support it received was especially strong for subsidies and other financial support and somewhat lower for credit guarantees. Figure 29 shows the share of companies that received support from each of the three types of policy. Again, the larger the sales decline, the higher the intensity of the support. The difference is especially marked for subsidies and financial support, as it reaches 30% between companies with no sales decline and those posting major declines. The magnitude of this difference is consistent with the nature of the support, which mostly includes measures to maintain labour, and is therefore tied even more closely to demand. Conversely, subsidised or guaranteed credits tend to be less popular. At the beginning of the crisis, the uncertainty prompted firms to tap cheap available credit to insure against possible future liquidity shortfalls. However, once certainty was restored and firms were reassured that they could continue to access financing, demand for precautionary liquidity fell. Ultimately, the availability of credit guarantees in most countries outweighed their actual use.

We estimate how a firm's characteristics influence whether it receives policy support. Separate probit models are estimated, each time controlling for country, sector, size and sales loss, with each factor then added one by one. Figure 30 plots the change in the predicted probability of getting policy support (of

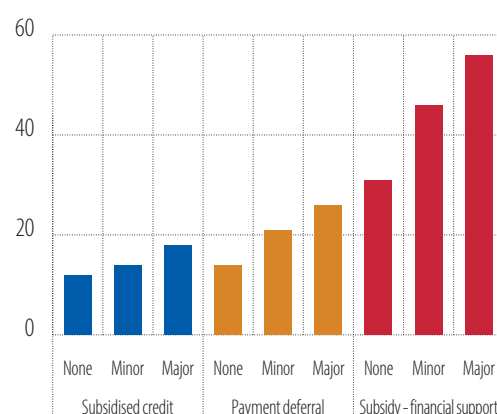
any type). When the characteristic is binary, its presence or absence is reported as “yes” or “no.” When it is continuous, “high” refers to being in the last decile and “low” in the first decile. The vertical line reports the 95% confidence interval of the probability. When the two lines overlap, the factor does not alter the probability of receiving support significantly.

Figure 28
Distribution of the change in sales and public support (% of firms)



Source: EIB estimates based on EIBIS 2021.
Note: Change in sales reported on the x-axis.

Figure 29
Public support by sales decline and policy instrument (% of firms)



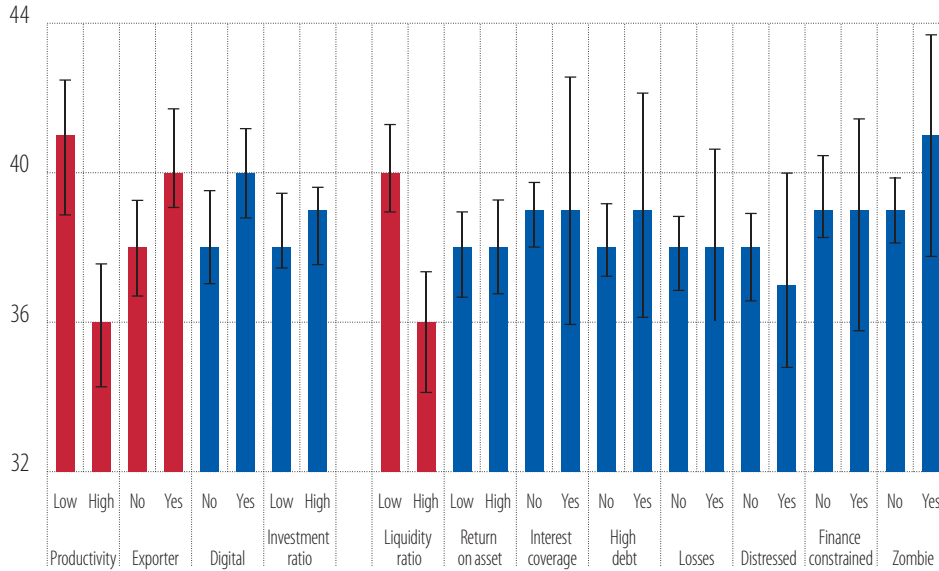
Source: EIBIS 2021.
Note: None, minor and major refer to firms not recording sales declines, firms recording sales declines of less than 25% and firms recording sales losses of more than 25%.

More productive firms and those that didn't export were less likely to receive public support, which probably illustrates how the crisis affected some sectors more than others. Beyond the control variables, real firm characteristics are not taken into account, except for productivity and whether a firm exports. A firm's productivity appears to be an important factor when the top and bottom deciles are considered. The most productive firms did not avail themselves of support and for the three first quartiles, no distinction is detected. This finding mainly reflects the greater impact the crisis had on less productive sectors. Being an exporter is also significant, albeit to a lesser extent. Exporters were more likely to accept public support. The other real characteristics do not seem to have an impact.

Only firms with low liquidity ratios were more likely to receive public support. While firms exhibiting financial distress, low returns on assets, losses and high indebtedness are more likely to receive support, the difference is not significant. Conversely, firms that have lower liquidity ratios or fewer cash buffers are significantly more likely to receive policy support. The primary objective — preventing liquidity from drying up and averting a sharp rise in insolvencies — therefore appears to have been met (Hadjibeyli et al., 2021). Overall, we have not found evidence that support was tilted towards firms that were already weak before the crisis, such as financially distressed or zombie firms. In fact, policy support in several countries specifically incorporated features intended to prevent this outcome. Focusing on firms located in Croatia, Finland, Slovenia and Slovakia, Bighelli et al. (2021) also conclude that employment subsidies and direct subsidies have only been marginally directed towards zombie firms.¹¹

¹¹ Zombie firms are defined in the literature as old firms that have persistent problems meeting their interest payments but that often survive thanks to bank forbearance, prolonged monetary stimulus or other firm-specific policy support (McGowan et al., 2018). We define zombie firms as firms that are older than ten years and whose interest rate coverage ratio was below one in the year before the pandemic (2019 or 2018 when the 2019 data are not available).

Figure 30
Predicted probability of receiving public support (% of respondents), by firm characteristics before COVID-19

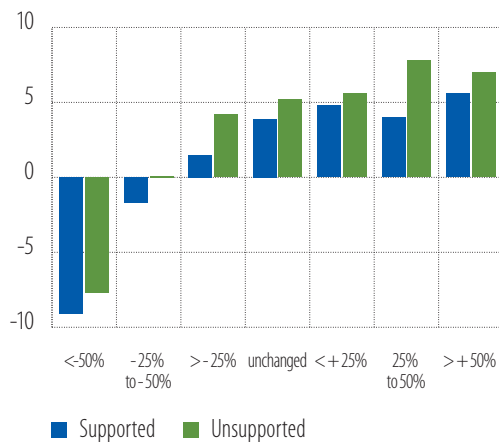


Source: EIBIS 2021.
Note: Red indicates the cases where the difference is significant. Based on the preliminary matched database.

The short-term impact of support

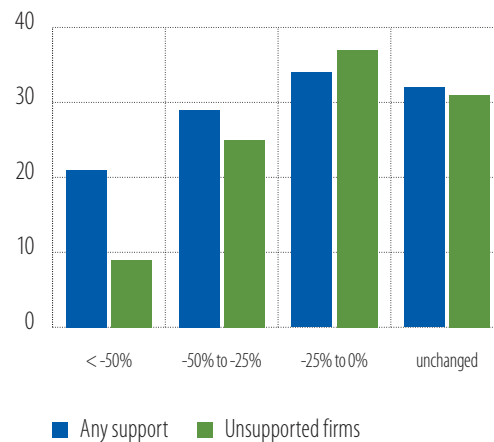
Despite the efforts, the profitability rate of firms benefiting from policy intervention lag behind 2019 figures. Figure 31 shows that the profit distribution of firms without (or not needing) support has shifted towards the right. The margins of supported firms have shifted below those of firms not receiving support.

Figure 31
Profit rate by sales decline (in %)



Source: EIBIS 2021.

Figure 32
Policy support and investment plans (% of firms), by loss of sales



Source: EIB estimates based on EIBIS 2021. Note: the y-axis reports the share of firms planning to increase investment.

The estimates confirm that sales declines caused by the pandemic were a factor in pushing down investment. Table 1 reports the estimated results of several linear probability models explaining the likelihood of investment being reduced. In all cases, a change in sales, measured at the level of the country and sector, is negatively related to the probability of scaling down investment. The impact is significant at 5% and very stable across all the 12 sectors.

Public support allowed firms to preserve investment, as it reduced the impact of lost sales. Figure 32 plots the percentage of firms planning to invest more in the current financial year, depending on the sales declines they recorded during the first year of the COVID-19 crisis. The figure distinguishes between firms having received support and those that have not. The share of firms planning to invest more increases as the decline in sales decreases. Firms receiving support plan to raise investment more than firms with similar sales declines. The difference is especially pronounced when the loss in sales is large. The estimates confirm that large sales declines lead to lower investment, and that public support partly compensated for this impact. We used a probit model to explain the probability that a firm will increase investment in the current financial year. The estimates confirm that a sales decline of above 25% reduces the probability of increasing investment by 5 to 8 percentage points. At the same time, obtaining public support, of any type, significantly increases the probability of raising overall investment by 2 to 3 percentage points.

Policy support shielded investment in IT and business processes, but not in training. Looking across investment types, public support cushioned investment overall, but the effect was very different depending on the asset type. Investment was positive and significant for software, data, IT networks and website activities, and for organisation and business process improvements. The crisis forced firms to try out new ways of working. Remote working, IT, digitalisation and the necessary reorganisation of working models and processes were a clear priority. Policy support did not, however, manage to shield investment in training employees.¹²

Financial constraints, sales mark-ups and the utilisation of existing capacity also influenced investment plans. Besides a change in sales, the models also consider capacity utilisation, mark-ups and financial constraints as factors that influence investment. Considered separately or together, the three factors have a significant influence that is consistent with expectations. For the same decline in sales, financially constrained firms tend to reduce investment by more, as do firms working under capacity. Conversely, firms that operate with higher mark-ups and show a greater likelihood of accumulating more internal financing tend to reduce investment less.

Table 1
Firms planning to reduce investment: Cash holdings and equity-influenced decisions

	Without mitigating factors					Capital to assets				Cash to assets			
	Linear		Rectangular		Linear		Rectangular		Linear		Rectangular		
Turnover change*	-0.62***	-0.62***	-0.70***	-0.64***	-0.69***	-0.65***	-0.71***	-0.63***	-0.71***	-0.64***	-0.71***	-0.63***	-0.62***
	(-0.05)	(0.05)	(0.06)	(0.05)	(0.06)	(0.06)	(0.07)	(0.06)	(0.07)	(0.06)	(0.07)	(0.08)	(0.09)
under.	3.81***		2.61**		4.28***		4.27***		3.534***		3.53***		
	(-1.03)		(1.19)		(1.11)		(1.11)		(1.126)		(1.13)		
mark-ups	-2.17**		-1.91**		-2.24**		-2.24**		-2.01**		-2.02**		
	(0.86)		(0.88)		(0.92)		(0.92)		(0.92)		(0.92)		
Fin. Const.	4.38**		6.06***		-1.91		(2.26)						

12 Policy support is accompanied by a 2 percentage point increase in the share of investment in digital equipment, and a 1.3 percentage point increase in organisation and business process improvements. Both effects are significant at 5 percentage points. Conversely, policy support is accompanied by a non-significant increase in the share of R&D by 0.5 percentage points and a non-significant decrease in the share of training by 0.2 percentage points.

Part II Recovery from the COVID-19 pandemic, scarring and asymmetry

	Without mitigating factors				Capital to assets				Cash to assets				
	Linear		Rectangular		Linear		Rectangular		Linear		Rectangular		
Capital	-2.97	-2.29	-3.98	-2.22									
	(1.47)*	(3.10)	(2.65)	(3.98)									
Capital* turnover			-0.18	0.01									
			(0.16)	(0.24)									
Cash									-8.94**	-7.30*	-9.68**	-11.15***	
									(3.32)	(3.75)	(3.79)	(4.26)	
Cash* turnover											-0.12	-0.63*	
											(0.32)	(0.35)	
Observations	9 535	9 484	7 372	9 298	7 251	8 179	6 399	8 179	6 399	7 985	6 243	7 985	6 243

Sources: EIB estimates.

Note: Linear probability model with 1 when the company plans to lower investment. Size is 1 for small and medium-sized firms, 0 for large firms. Under reports capacity utilisation: 1 for firms working below production capacity prior to COVID-19. Mkup signifies mark-ups. *: sales change at the sector-country level. Constants are included. Both cash and capital position are considered as a share of total assets. Robust standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Cash holdings and strong capital positions lessened the impact of lost sales. Table 1 also reports the estimated results of the model that includes capital to assets and cash to assets ratios. These two characteristics, associated with a stronger balance sheet, limit how much a lost sales result in a cut in investment. More capital and cash cushion how debt taken on during the crisis affects investment. Non-linearity for cash is also indicated, as hoarding cash is an effective way of offsetting a decline in sales.

The recovery in investment

In this section, we analyse the factors that would enable firms to come out of the crisis stronger, and improve their productivity. We also examine the impact of public support on investment plans, controlling for sales losses and balance sheet structure. Firms that benefited from policy support tend to be more optimistic regarding their investment plans. The impact is especially pronounced for investment in digital technologies. In some cases, the impact is also strengthened because public support allowed firms to recapitalise.

It will take time to evaluate the impact that public support ultimately has on firms. While the data reported by listed firms are more up-to-date, firm-level data are generally known to have a lag of around two years. Moreover, some of the policy measures have automatically postponed firms' bankruptcies. However, the literature suggests that crises triggered by pandemics have a bearing on medium-term growth. Aguirre and Hannan (2021) take a long-term perspective and analyse the aftermath of five pandemics. The authors show that so far, the pandemic's adverse effect were limited in countries that provided greater public support.

The COVID-19 crisis has affected productivity and business dynamics in euro area countries through four main channels: (i) workers changing sectors as they change jobs, (ii) creative destruction and workers changing jobs within the same sector, (iii) the adoption of digital technologies and (iv) teleworking. Criscuolo (2021) shows that the shifts in the labour force are sizeable and are tilted towards high-productivity sectors. Firms have also accelerated the ongoing digital transformation and have adopted remote working. However, not all firms went "digital and remote" to the same extent. Firms that were already more digital before the crisis adopted even more advanced technologies, with implications for productivity and business dynamics in the aftermath of the crisis. Box C presents an overview of the literature on the impact of firm-level policy support.

Box C**An overview of public support's impact**

The analysis of COVID-19 support builds on a vast literature of microeconomic impact assessments. The impact of loan guarantees for firms in normal times is well documented. EU evidence finds that loan guarantees have a significant positive impact on firms' size, revenues, employment, investment and survival (Asdrubali and Signore, 2015) and innovation (Bertoni et al., 2019; Brault and Signore, 2019).

Likewise, past subsidised loan programmes for small and medium-sized firms have been found to have positive effects on job creation, investment and productivity in Bulgaria (Erhardt, 2017) and Hungary (Horvath and Lang, 2021; Endresz et al., 2015). Finally, firm-level evidence shows that job retention schemes prevent layoffs and safeguard firms' survival: for instance Lydon et al. (2019), Kopp and Siegenthaler (2019) and Guipponi and Landais (2020).

Although the available data are still limited, early evidence indicates that firms are positively affected by public support at the national level during the pandemic. A selection of model-based simulation exercises helped to inform policymakers from an early stage of the pandemic. Gourinchas et al. (2020), Lopez-Garcia (2020), Blanco et al. (2021), Demmou et al. (2021a,b), Díez et al. (2021), Ebeke et al. (2021) and Maurin and Pal (2020) highlighted the potential of support measures to reduce liquidity shortfalls, bankruptcies, and output and employment losses compared to a non-intervention scenario. Nevertheless, the true impact can only be gauged when detailed firm records become available.

More than a year and a half into the pandemic, firm-level evidence is emerging. Hadjibeyli et al. (2021), for example, perform a microsimulation exercise using data on French firms up to December 2020. The simulations show that, thanks to furlough schemes, direct subsidies and tax relief, the increase in illiquidity is 12 percentage points lower, and the increase in insolvencies 5.3 percentage points lower relative to a scenario without such policies. 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 that faced a negative shock to their cash flow, thanks largely to support measures in France (not including loan guarantees). France Stratégie (2021) extends the simulations to data available up to March 2021, showing that the support measures (including loan guarantees) reduced by 13 percentage points the share of firms that faced a drop of more than 25% in the value they added. Lalinsky and Pal (2021) use firm-level data from Slovakia from March to June 2020 to investigate government wage subsidies. They find significant drops in the probability of firms facing illiquidity (3.5%) and insolvency (3.5%) when they are granted support. Both studies find stronger effects for smaller firms.

The positive short-run impact of public support does not preclude medium-term risks for governments. While pandemic-related loan guarantees have the benefit of spreading around exposure to the pandemic, 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 the pandemic (Core and De Marco, 2021). Interestingly, firm-level evidence for four other EU countries (Croatia, Finland, Slovakia and Slovenia) suggests that this does not hold for employment subsidies and direct subsidies, with support distributed to firms with medium levels of productivity, and only marginally to zombies (Bighelli et al., 2021).

National public support measures have played an important role in stabilising the economy and bank lending during the pandemic. Preliminary firm-level evidence shows a decisive role for the support measures in limiting insolvencies and safeguarding employment. The public support schemes that were introduced in response to the pandemic — in particular state-backed loan

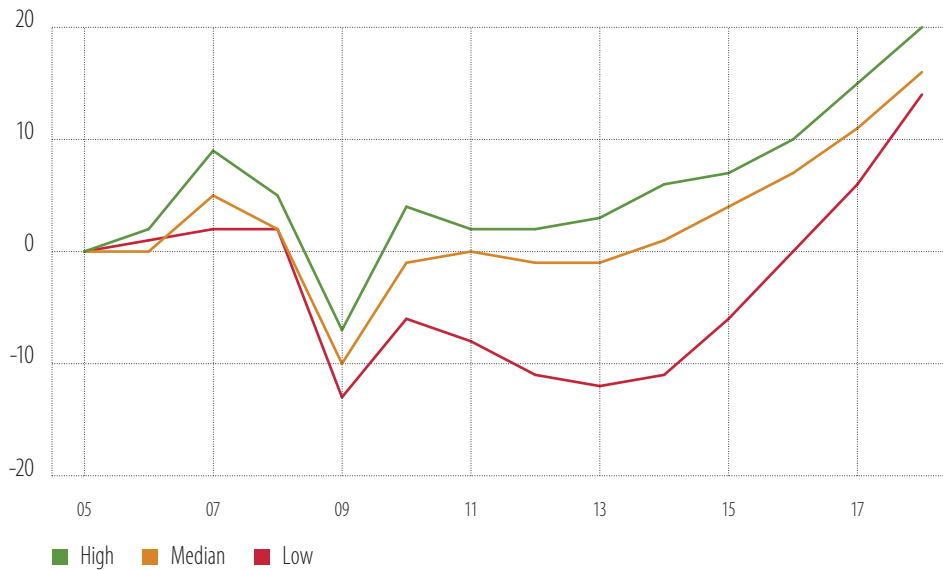
guarantees — however, also constitute sizeable contingent liabilities for governments, therefore raising concerns about the potential medium-term risks they may face. Moreover, corporate indebtedness is rising, as loans were issued to help firms whose capital had been worn away by losses. That indebtedness increases the risk of insolvency and of lower investments in the medium term (Maurin and Pal, 2020).

Crises and productivity gaps among firms

Major crises tend to be associated with a widening of the productivity gap. In Figure 33, European firms are split into three groups depending on the estimated level of total factor productivity in 2005: low, median and high productivity groups.¹³ The productivity gap between the high and the low groups started to widen substantially from 2009 to 2011 in the aftermath of the global financial crisis. The gap widened even further during the sovereign debt crisis, albeit less significantly. It was only during the upturn after 2014 that firms with the lowest productivity levels were able to recover. Overall, their productivity rose by close to 15% from 2005 to 2018, at the same rate recorded by the firms in the two other groups. These broad trends are relatively robust (Delanote et al., 2018; Andrews et al., 2017).

Figure 33

Pre-crisis productivity trends (total factor productivity estimated with Wooldridge-Levinsohn-Petrin technique, 2005=100)



Source: EIBIS 2020.

Note: Estimates based on ORBIS using the Wooldridge-Levinsohn-Petrin (WLP) technique, controlling for sector and country fixed effects. Results reported for the manufacturing sector.

We split firms into seven groups based on their initial productivity level and the change recorded. In Figure 34, we report the breakdown. Firms with low productivity can remain in the low segment, “Stuck” or move to a higher productivity group, becoming “Reachers.” Firms in the medium segment can remain there, “Platoon,” shift down, “Fallen platoon,” or climb the productivity ladder and reach the top group,

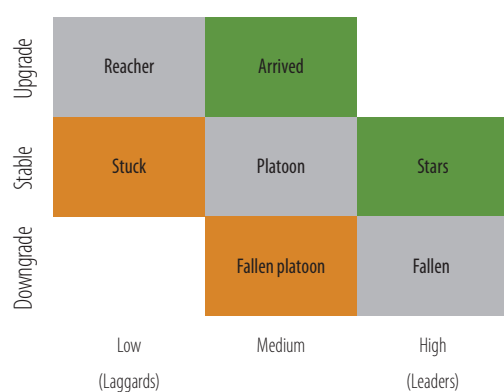
¹³ The allocation is achieved after controlling for macro-wide differences in countries’ total factor productivity. Many caveats and methodological choices are associated with Figure 38. First, the underlying sample: here the manufacturing firms available in ORBIS over a long period of time. Second, the method used to estimate total factor productivity: here the WLP technique. Third, the dependency on initial conditions: here we split firms based on their total factor productivity in 2005, the first year of the upturn in the European Union.

becoming “Arrived.” Finally, firms at the top can remain there, “Stars,” or move down, “Fallen.” We use this breakdown to analyse the mobility of firms in the three European regions over the recent period, since the beginning of 2005.

On average, movement among firms is more pronounced in Western and Northern Europe. Figure 35 depicts the average probability of moving up from a low or median level in the three regions, over three periods: 1) before the global financial crisis, from 2005 to 2008, 2) during the global financial and sovereign debt crises, from 2009 to 2013 and 3) post crises (but prior to the COVID-19 crisis) from 2014 until 2018. In Western and Northern Europe, the probability of climbing the productivity ladder is structurally higher. Conversely, it tends to be lower in Southern Europe.

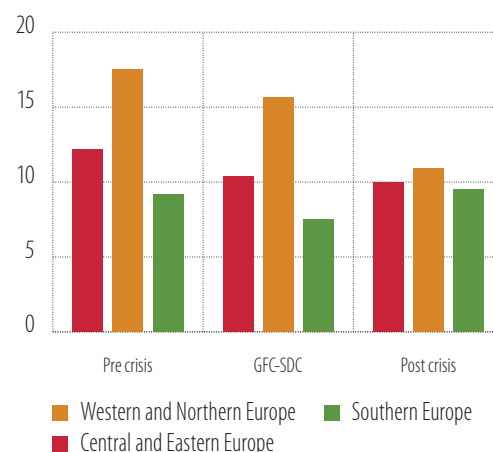
Over time, the probability of climbing the productivity ladder has evolved differently for the three regions. Figure 35 also shows that for Western and Northern countries, the probability has been declining over time, and has fallen sharply over the most recent period. At the end of the recent period, the probability is only slightly higher than for other European regions. Conversely, the likelihood of moving up has recently recovered in the Southern Europe. It declined before the current crisis and during the global financial crisis-sovereign debt crises as these economies suffered major credit disruptions and much tighter access to external finance. But as the region’s economies continued to recover from these crises (before COVID-19), the transformation of firms resumed, and the probability of moving up reached levels slightly below those of EU peers. Finally, the probability has somewhat declined in Central and Southern Eastern Europe as these economies have continued along the path to convergence, narrowing the gap with the more advanced EU economies.

Figure 34
The ladder (in %, European Union)



Source: EIB estimates.

Figure 35
Likelihood of moving up (in %)



Source: EIB estimates based on ORBIS.

Note: Pre-crisis is 2005-2008, global financial crisis-sovereign debt crisis is 2009-2013 and post-crisis is 2014-2017. The probability of moving from the low to median or high and from the median to high, rescaled by three.

Firms’ characteristics and mobility on the productivity scale

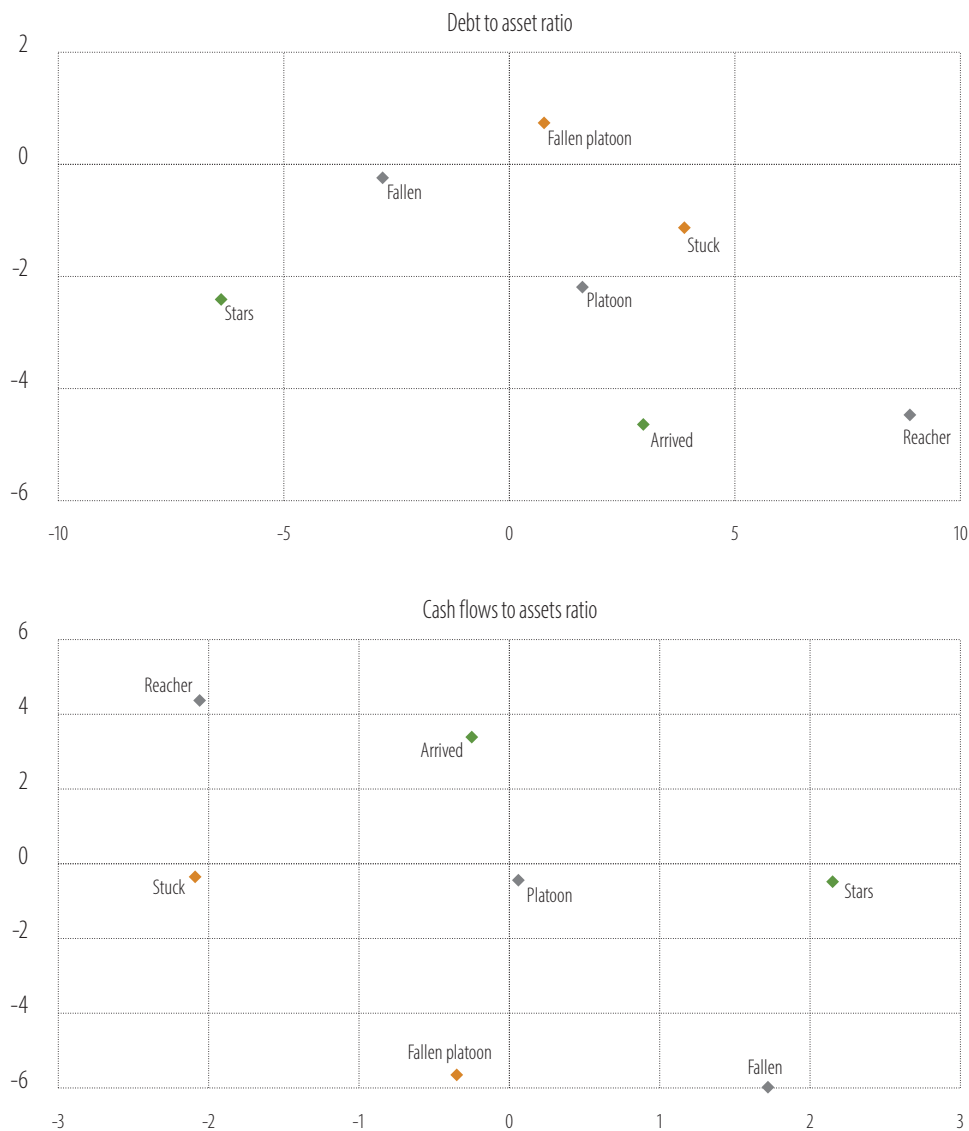
Certain characteristics influence the likelihood of moving up the productivity scale. Looking separately at three balance sheet ratios (debt to assets, cash flow to assets and the investment ratio), Figure 36 positions the seven types of firms in a quadrant. The firms are allocated to each of the seven groups over periods of three years. For each group, the x-axis indicates the deviation between the average ratio for the firms in the group and the overall average. The y-axis indicates the change, three years later. The

three colours reflect the productivity level, consistently with Figure 34: green for high productivity, light grey for median productivity and brown for low productivity. Each group of firms is shown distinctly in the quadrant.

Investment and its financing appear to highly influence mobility on the productivity ladder. Compared to firms with the same productivity level, firms that move up start with higher investment rates, resulting in higher indebtedness and lower cash positions. Thereafter, once they have reached higher productivity levels, they record a higher increase in the cash flow to assets ratio and lower change in the debt to assets ratio. The trend is symmetric for firms that drop down the productivity ladder: because they invest less, they have higher cash ratios and lower indebtedness. However, once they have moved and become relatively less productive, cash positions erode and debt ratios increase more than peers.

Figure 36

Firms' fundamentals and movements within the group (x-axis: deviation from the mean; y axis: change. Both axes are in percentage points)



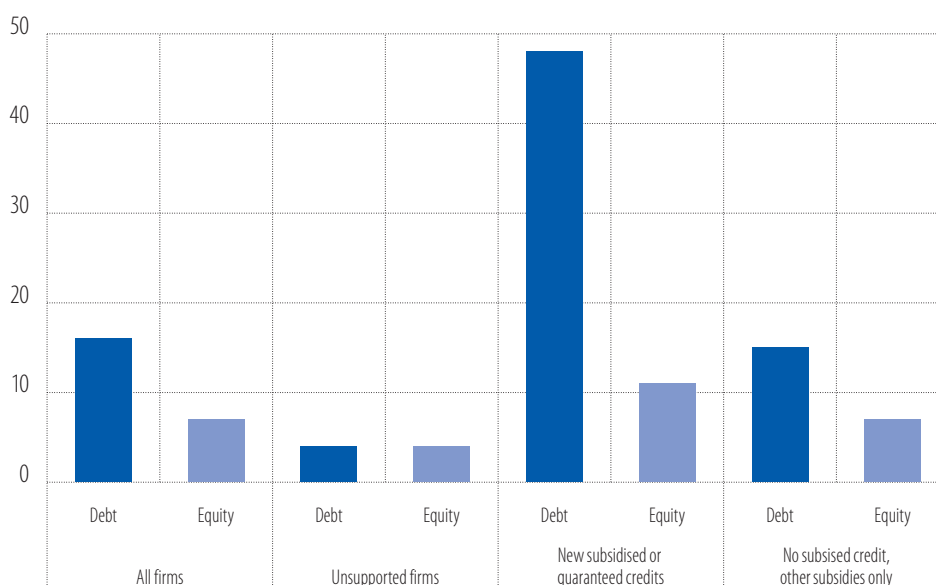


Source: EIB estimates based on ORBIS.

Note: The green, grey and orange colours indicate firms in the high, median and low productivity range.

During the crisis, leverage increased for 17% of firms. The increase was greater for small and medium-sized enterprises than for large enterprises. 17.5% of SMEs vs. 15.2% of large enterprises increased their debt as a response to the pandemic. As shown in Figure 37, the increase was somewhat stronger for firms receiving support, particularly in the form of subsidies or guaranteed credit. Receiving this form of policy support automatically raised these firms’ leverage. The firms were more likely to preserve their investment plans and used credit to finance them.

Figure 37
Policy support and balance sheet expansion



Source: EIB estimates based on EIBIS 2021.

Public support raises the likelihood of firms' increasing their equity. Firms that recorded sales declines were more likely to increase their equity and to receive public support. The combination of these two effects may suggest that recapitalisation needs resulting from large losses were more likely to be fulfilled by firms receiving policy support. Receiving such support might increase the probability of a firm attracting other equity investors. This interpretation is borne out by the estimated impact of firm characteristics. The higher the financial leverage and the lower the capital ratio pre-COVID-19, the likelier the increase in equity. The change in the financial structure possibly corrects weakness on the balance sheet.¹⁴ Overall, 7% of supported firms have raised equity, above the ratio of non-supported firms.

There has been a strong recovery of the venture capital market. Focusing on the venture capital, Box D details the results of the 2021 venture capital survey conducted by the European Investment Fund (EIF). The survey points to a strong recovery of the European venture capital market, following a slump in the first half of 2020.

Box D

The EIF VC Survey and the EIF Private Equity Mid-Market Survey

The 2021 wave of the EIF VC Survey includes anonymous responses from 479 venture capital fund managers (from 379 venture capital firms), some of whom are EIF counterparties.¹⁵ The majority of the respondents are chief executives or managing/general partners, which suggests that their responses reflect the views of decision-makers in venture capital/private equity firms.

The latest survey waves mainly covered market sentiment and the impact of COVID-19, investments in the environment and climate, as well as gender diversity. The results of the market sentiment section of the EIF VC Survey are published in Botsari et al. (2021). Responses were received from 2 July to 4 August 2021. The results of the 2021 survey point to a strong recovery of the European venture capital market, following an initial slump when the the COVID-19 crisis started to weigh on the economy in the first half of 2020.

According to the EIF VC Survey, venture capital fund managers are once again optimistic. The current market situation is perceived to be even better than before the crisis. Expectations for the market through mid-2022 are very positive across several categories (as regards the fundraising environment, for instance, or the ease with which co-investors can be found and the number of new investments). These expectations are at the highest level since the survey was introduced in 2018. After a strong decline in the fall of 2020, venture capital fund managers' perception of business opportunities is back to the levels reached in the previous four survey waves. Expectations regarding opportunities in the next 12 months are generally positive. The perception of the fundraising environment has reached an all-time high. Expectations for the future fundraising environment are more optimistic in 2021 than they were in the fall of 2020.

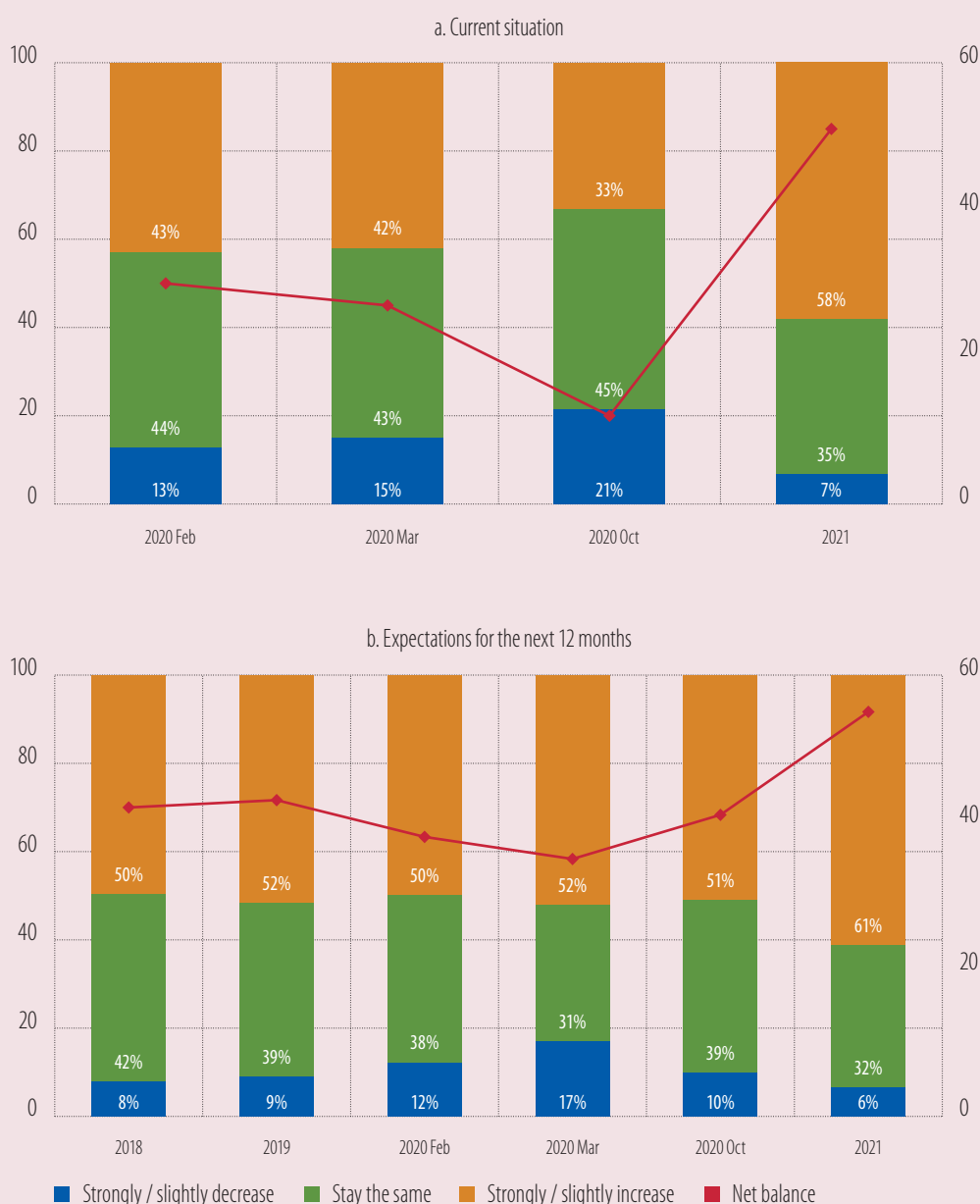
The percentage of respondents reporting an increase in their number of new investments is larger than before the COVID-19 crisis (Figure D.1). Most respondents reported more investments, and a further increase is expected. Venture capital fund managers can select from an increased number of incoming investment proposals, and the number is expected to rise even further. Fewer venture capital fund managers invested exclusively in follow financing for portfolio companies, and finding co-investors has become less difficult. During the COVID-19 crisis, investment expectations showed only a small slump. In 2021, expectations for the next 12 months even reached record-high levels (Figure D.2).

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

¹⁵ With the EIF Private Equity Mid-Market Survey, the EIF VC Survey currently represents the largest regular survey exercise among general partners in Europe.

The environment for exiting investments has recovered since last year. Expectations have improved, but are below 2018 levels. In 2021, insolvencies/liquidations decreased from relatively high levels, while initial public offerings (IPOs) have gained more prominence. A large part of exits happened outside the European Union, through IPOs or sales of listed stocks.

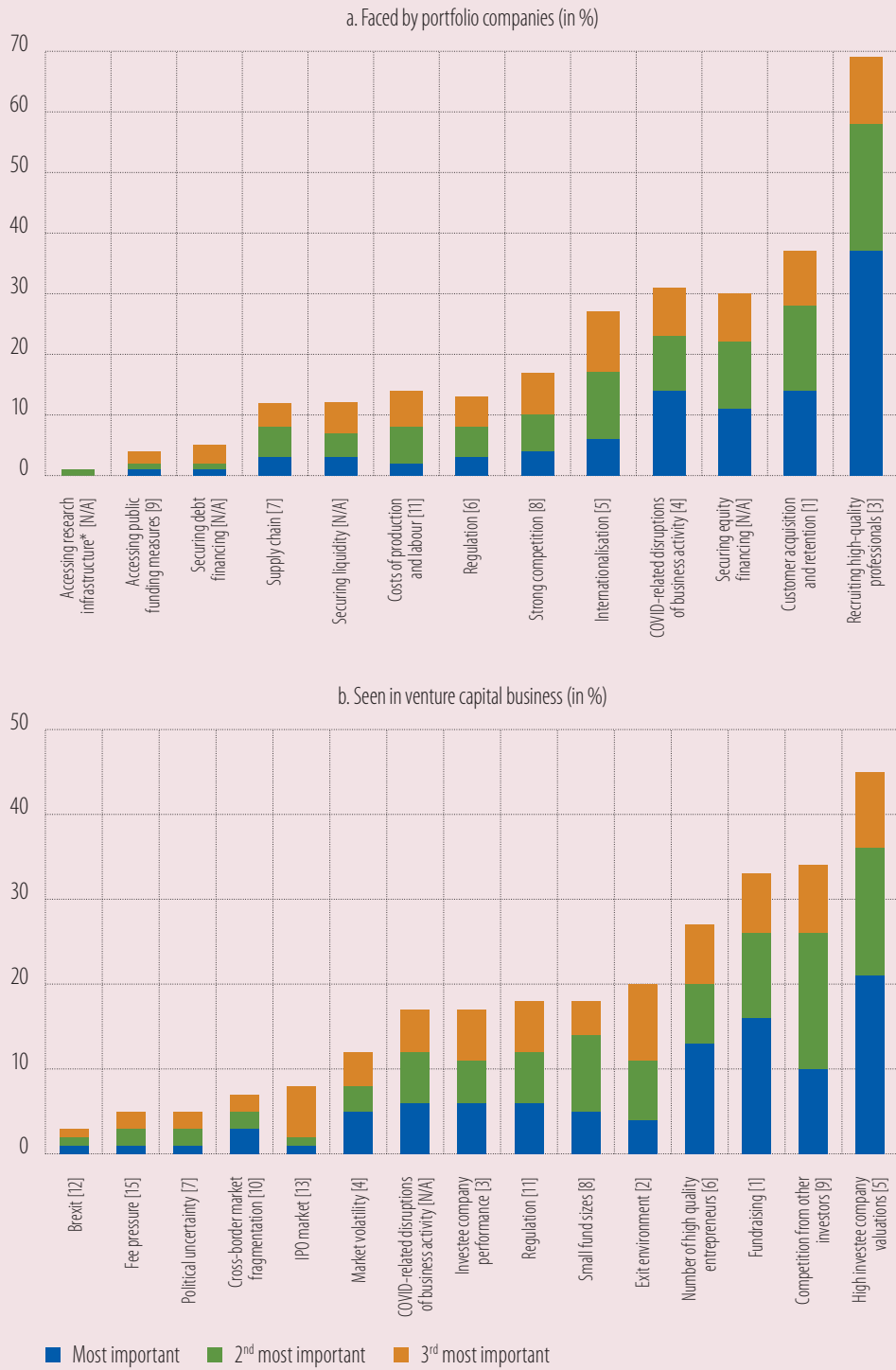
Figure D.1
Number of new investments



Source: Botsari et al. (2021).

Following a slump during the pandemic in 2020, valuations and exit prices have increased again. The majority of venture capital fund managers expect a further increase in exit prices over the next 12 months. These fund managers report that competition for investee companies has increased recently and expect this development to continue.

Figure D.2
Biggest challenges currently



Source: Botsari et al. (2021).

Portfolio companies developed better than expected for most venture capital fund managers. A large majority of respondents expect further improvement. An even larger majority (compared to autumn 2020) of venture capital fund managers do not expect any insolvencies because of COVID-19. Portfolio companies' access to finance is at a record high and expected to (at least) stay high in the near future. "Recruiting high quality professionals" has remained the biggest challenge faced by portfolio companies through 2021 except in the autumn of 2020, when more immediate challenges were cited because of the COVID-19 crisis (Figure D.2, panel a). The impact of the crisis was uneven for firms receiving venture capital, and was positive or negative depending, for example, on the economic sector of the portfolio company. The largest share of respondents view the impact of COVID-19 on the current performance of their fund(s) or portfolio as neutral. For the impact of COVID-19 on the expected final performance of their fund(s) or portfolio, respondents are even more positive. More respondent expected net asset value to grow in 2021 than in 2020.

"Fundraising," "high investee company valuations" and "number of high quality entrepreneurs" are consistently cited as the most significant challenges in the venture capital business. In 2021, "high investee company valuations" have become the biggest challenge (Figure D.2, panel b). Despite these challenges, venture capital fund managers are confident in the long-term growth prospects in Europe and in their own markets.

Impact of the crisis and public support for the digitalisation of firms

More productive firms have been digitalising more, with an effect on the digital divide. Our analysis shows that firms with higher productivity are more likely to invest in digitalisation. This result is shown in the breakdown by sector and country in which firms operate. In the same country and sector, therefore, the more productive firms are more likely to digitalise further. This dynamic may widen the productivity gap as digitalisation is likely to foster productivity.

Firms receiving policy support are able to mitigate the impact of lost sales, which shields their investment in digitalisation. Table 2 explains the likelihood of strengthening digitalisation, with financial expansion, debt and equity also factored in.¹⁶ In all the estimates reported in Table 2, lost sales affect digitalisation negatively, reducing the likelihood that a firms will digitalise further by 5 to 10 percentage points. However, the effect is compensated by the allocation of policy support. Firms that received this support are across the board 4 to 5 percentage points more likely to digitalise. Firms that received policy support and suffered large sales losses are 5 percentage points more likely to digitalise than firms that experienced sales losses but did not receive policy support. Finally, stronger firms, firms not in distress and firms with lower leverage or a higher capital base are more likely to digitalise, although these effects are only significant at 10%.

¹⁶ For more details, see Harasztosi et al. (2021). We estimate the following equation:

$$q_{i,c,t} = \alpha.Sales_i + \beta.Pol_i^k + \gamma.Sales_i \times Pol_i^k + \delta.Fin_i + Z_i + \theta_{sec} + \theta_{size} + \theta_c + \epsilon_i$$

Where Fin relates to financial expansion, whether the firm has raised equity and/or debt. $Sales$ is the dummy variable indicating if the firm reported a decline of more than 25% in its sales. Pol indicates that the firm has benefited 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 profit and loss statement. Labour productivity is always incorporated in the equations, as a standard determinant of investment.

Table 2
Likelihood of becoming more digital

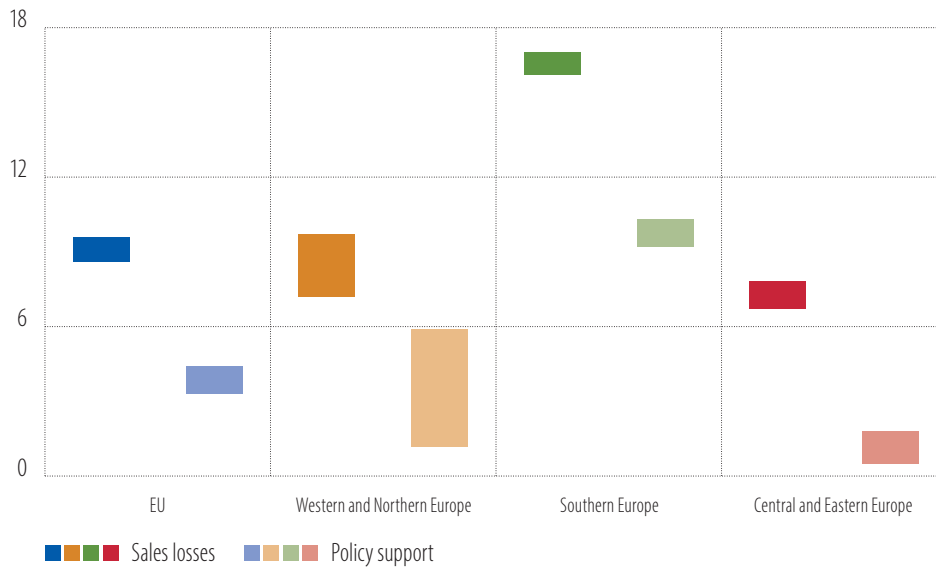
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Policy support	0.046*** [0.011]	0.053*** [0.011]	0.055*** [0.011]	0.052*** [0.013]	0.052*** [0.011]	0.045*** [0.012]	0.047*** [0.013]	0.045*** [0.014]	0.043*** [0.012]
COVID-year sales loss above 25%		-0.060*** [0.013]	-0.055*** [0.014]	-0.051*** [0.016]	-0.058*** [0.013]	-0.092*** [0.020]	-0.088*** [0.022]	-0.085*** [0.027]	-0.094*** [0.021]
COVID-year sales loss above 25% X policy support						0.047* [0.025]	0.049* [0.027]	0.048 [0.032]	0.053** [0.026]
Pre-COVID productivity	0.043*** [0.007]	0.042*** [0.007]	0.038*** [0.007]	0.031*** [0.008]	0.038*** [0.007]	0.042*** [0.007]	0.038*** [0.007]	0.031*** [0.008]	0.038*** [0.007]
Debt increase	0.050*** [0.015]	0.058*** [0.015]	0.062*** [0.016]	0.050*** [0.017]	0.060*** [0.015]	0.058*** [0.015]	0.062*** [0.016]	0.050*** [0.017]	0.060*** [0.015]
Equity injection	0.036* [0.021]	0.041** [0.021]	0.048** [0.023]	0.044* [0.026]	0.041* [0.021]	0.042** [0.021]	0.049** [0.023]	0.044* [0.026]	0.042* [0.021]
Financial leverage			-0.010* [0.005]				-0.010* [0.005]		
Firm in distress				-0.024 [0.016]				-0.024 [0.016]	
Capital ratio					0.018 [0.021]				0.018 [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: Estimates based on EIBIS 2021 matched with firm-level ORBIS information (see Harasztosi et al., 2021).

Note: Linear Probability Model estimated with firm size dummies and firm age dummy. FE means fixed-effects. 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

The availability of finance allowed firms to anchor their digitalisation. Interestingly, in all cases, firms more likely to digitalise have increased their external financing, an effect that is always significant at 10% at least. Increased equity therefore raises the probability of a firm digitalising more by 4 to 5 percentage points. A slightly stronger effect is found for debt. When considered jointly with the factors explaining a stronger equity base, this finding suggests that the public support rolled out during the crisis helped crowd in investors and sped up the digital transformation of European firms.

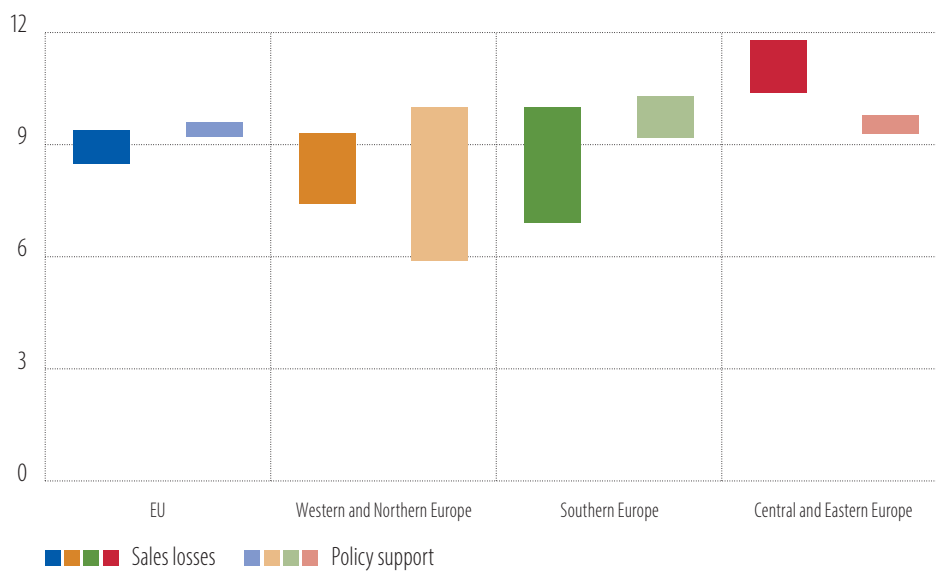
Figure 38
Estimated impact on the likelihood of increasing investment (in percentage points)



Source: EIB estimates based on EIBIS 2021 and ORBIS.

Note: The bars indicate the impact range estimated through a suite of models. See Harasztosi et al. (2021). The impact of sales declines (of above 25%) is always negative and is reported in absolute terms.

Figure 39
Estimated impact on the likelihood of increasing digitalisation (in percentage points)



Source: EIB estimates based on EIBIS 2021 and ORBIS.

Note: The bars indicate the impact range estimated through a suite of models. See Harasztosi et al. (2021). The impact of sales declines (of above 25%) is always negative and is reported in absolute terms.

Public support differs across the various regions. Public support was deployed widely, but it differed in the various countries. Eligibility, measures and conditions were not the same, so firms were not provided with the same incentives. Figure 38 and Figure 39 summarise the results of the models used to assess the impact of public support on the change in firms' investment plans and digitalisation efforts. Different models are used, so the figures depict a range of estimates (Harasztosi et al., 2021). The estimates for the European Union and the EU macro regions are reported separately. The first result is common to the European Union and all sub-regions. Lost sales from COVID-19 always have a negative impact on investment, which is never fully compensated by policy support. The uncompensated effect of sales on investment is especially large in Southern and Central and Eastern Europe. The picture is somewhat brighter for investment to advance digitalisation. For this form of investment, policy support has, to a certain extent, countered the negative effect of lost sales in the European Union overall, and in Western and Northern and Southern Europe, but not in Central and Eastern Europe.

Some firms have not started to digitalise, despite the pandemic and having received public support. The share of firms that were not digital and have not started to digitalise varies widely across the 12 sectors considered throughout this chapter, from less than 10% in computers and electronics, IT and telecommunications, and chemicals and pharmaceuticals, to more than 30% in hotels and restaurants and construction.¹⁷ No clear pattern emerges among those firms as weak firms are independently distributed. Across sectors, the proportion of zombie firms that were not digital and have not started to digitalise is similar to that of non-zombies.

¹⁷ See Chapter 5 for a macro analysis of the "neither firms."

Conclusion and policy implications

Corporate investment has started to rally, probably thanks to the massive policy support deployed. The strong and swift recovery in Europe suggests that, so far, policy support has reached its goal and shielded the corporate ecosystem. However, the rebound in investment relies heavily on the policy stimulus still in place and the actual damage sustained by firms will only be unveiled over time. As the current situation depends on this support, a clear indication of stronger activity is required before support can be removed. Phasing out support must not only be gradual, but also designed and explained in such a way that uncertainty is averted, because uncertainty is a major impediment to investment according to the firms polled in the EIBIS.

We did not find evidence of public support being excessively misallocated. Because it is not selective, the support provided by governments raises questions of moral hazard: firms that would have otherwise disappeared have been kept afloat. Public support might therefore lower the growth prospects of the European economy in the longer term. However, we did not find a link showing that more support went to firms that were already weak before the crisis. Instead, we found that firms with larger sales declines and low liquidity buffers received more support. In other words, the policy's main goal — preventing liquidity from drying up and the corporate ecosystem from stalling — seems to have been achieved.

Supported firms are more positive about their investment outlook and more likely to digitalise. These firms might have been in a better position to crowd in investors and to recapitalise. The combination of public support and a stronger equity base is accelerating the digital transformation of European firms — and the crisis has made the transformation more necessary than ever. Policymakers might re-prioritise public support to accompany the transition to the new normal. Equity-type instruments will be needed to rebalance firms' balance sheets as they have been affected by heavy losses and increasing leverage. Selected incentives might help and accelerate digital investments at firms.

While some firms are now stronger, pockets of vulnerability have developed and not all firms are taking the opportunity to transform. Some firms took advantage of the policy support to adjust, and to strengthen their digitalisation. Others did not, so vulnerability might emerge. Because the composition of EU economies differs, some EU members have been weakened more than others, which could cause an uneven recovery.

Policymakers must navigate the dangers of phasing out support too early and jeopardising the recovery — or doing harm by keeping support in place too long. Several countries have already withdrawn measures that supported firms. Maintaining these measures in other countries must be weighed against the risk of hampering the process of creative destruction and lowering growth in the medium term.

References

- Admati, A., Demarzo, R.P.M., Hellwig, M.F. and Pfleiderer, P. (2018). "The Leverage Ratchet Effect." *The Journal of Finance*, 2018, 73 (1), 145–198.
- Aguirre, J.P. and Hannan, S. A. (2021). "Recoveries After Pandemics: The Role of Policies and Structural Features." IMF Working Paper 2021/81.
- Almeida, H., Campello, M. and Weisbach, M.S. (2011). "Corporate Financial and Investment Policies when Future Financing is not Frictionless." *Journal of Corporate Finance*, 2011, 17 (3), 675–693.
- Altavilla, C., Barbiero, F., Boucinha, M. and Burlon, L. (2020). "The great lockdown: Pandemic response policies and bank lending conditions." CEPR DP No. 15298, September 2020.
- Andersson, M., Maurin L. and Rusinova, D. (2021). "Market finance as a spare tire? Corporate investment and access to bank credit in Europe." EIB Working Paper 2021/09 and ECB Working Paper 2606.
- Andrews, D. and Petroulakis, F. (2017). "Breaking the shackles: Zombie firms, weak banks and depressed restructuring in Europe." OECD Working Paper.
- Archarya, V.V. and Steffen, S. (2020). "The risk of being a fallen angel and the corporate sector dash for cash in the midst of COVID." NBER Working Paper 27601, July.
- Arena, M., Chen, R., Cuevas, A., Foda, K., Gracia, B., Liu, E.X., Pienkowski, A., Roehler, C., Shi, Y., Weber, S. and Xu, X.C. (2021). "Who bore the brunt of the pandemic in Europe? Shifting private stress to the public sector." IMF, European Department, Discussion Paper, 2021/015.
- Asdrubali, P. and Signore, S. (2015). "The Economic Impact of EU Guarantees on Credit to SMEs – Evidence from CESEE Countries." EIF Working Paper Series 2015/29, European Investment Fund (EIF).
- Bats, J., Greif, W. and Kapp, D. (2021). "Cross-sectoral dispersion in firms' earnings expectations during the COVID-19 crisis." Box 2, ECB Economic Bulletin, August 2021.
- Becker, B. and Ivashina, V. (2021). "Corporate Insolvency Rules and Zombie Lending." ECB Conference in Sintra.
- Bertoni, F., Brault, J., Colombo, M. G., Quas, A. and Signore, S. (2019). "Econometric study on the impact of EU loan guarantee financial instruments on growth and jobs of SMEs." EIF Working Paper Series 2019/54, European Investment Fund (EIF).
- Bighelli, T., Lalinsky, T. and CompNet Data Providers (2021). "COVID-19 government support and productivity: Micro-based cross-country evidence." CompNET Policy Brief 14, CompNET.
- Blanco, R., Mayordomo, S., Menéndez, A. and Mulino, M. (2021). "Impact of the COVID-19 crisis on Spanish firms' financial vulnerability." Occasional Papers no. 2119.
- Botsari, A., Kiefer, K., Lang, F. and Legnani, D. (2021). "EIF Venture Capital Survey 2021: Market sentiment." EIF Working Paper 2021/74. EIF Research & Market Analysis. 13 October 2021.
- Brault, J. and Signore, S. (2019). "The real effects of EU loan guarantee schemes for SMEs: A pan-European assessment." EIF Working Paper Series 2019/56, European Investment Fund (EIF).
- Bruegel (2021). "Loan guarantees and other national credit-support programmes in the wake of COVID-19."

Bureau, B., Duquerroy, A., Giorgi, J., Lé, M., Scott, S. and Vinas, F. (2021). "L'impact de la crise sanitaire sur la situation financière des entreprises en 2020 : une analyse sur données individuelles." Banque de France Working Paper 824, Banque de France.

Carletti, E., Oliviero, T., Pagano, M., Pelizzon, L. and Subrahmanyam, M.G. (2020). "The COVID-19 Shock and Equity Shortfall: Firm-level Evidence from Italy." Working Paper n° 566.

Coad, A., Amaral-Garcia, S., Bauer, P., Domnick, C., Harasztosi, P., Pál, R. and Teruel, M. 2021. "Investment expectations by vulnerable European firms in times of COVID: a difference-in-difference approach." EIB working paper, forthcoming.

Core, F. and De Marco, F. (2021). "Public Guarantees for Small Businesses in Italy during COVID-19." CEPR Discussion Papers 15799, Centre for Economic Policy Research (CEPR).

Criscuolo, C. (2021). "Productivity and Business Dynamics through the lens of COVID-19: the shock, risks and opportunities." ECB Conference in Sintra.

Degryse, H. and Ongena, S. (2005). "Distance, Lending Relationships, and Competition." *Journal of Finance*, 60(1): 231–266.

Delanote, J., Brasili, A. and Tueske, A. (2019). Reaching the European productivity frontier. *EIB Investment report (2019/2020)*, 331-370.

Demmou, L., Franco, G., Calligaris, S. and Dlugosch, D. (2021). "Liquidity shortfalls during the COVID-19 outbreak: Assessment and policy responses." OECD Economics Department Working Papers 1647, Organisation for Economic Co-operation and Development (OECD).

Demmou, L., Calligaris, S., Franco, G., Dlugosch, D., Adelat McGowan, M. and Sakha, S. (2021). "Insolvency and debt overhang following the COVID-19 outbreak: assessment of risks and policy responses." OECD Economics Department Working Papers 1651, Organisation for Economic Co-operation and Development (OECD).

Díez, F. J., Duval, R., Fan, J., Garrido, J., Kalemli-Özcan, S., Maggi, C., Martinez-Peria, S. and Pierri, N. (2021). "Insolvency Prospects Among Small and Medium Enterprises in Advanced Economies: Assessment and Policy Options." IMF Staff Discussion Note 2021/002, International Monetary Fund (IMF).

Doerr, S., Erdem, M., Franco, G., Gambacorta, L. and Illes, A. (2021). "Technological capacity and firms' recovery from COVID-19." BIS working papers, no. 965, October.

Dunne, T., Roberts, M.J. and Samuelson, L. (1988). "Patterns of Firm Entry and Exit in U.S. Manufacturing Industries." *The RAND Journal of Economics*, Vol. 19, N°4, 495-515.

Ebeke, C., Jovanovic, N., Valderrama, L. and Zho, J. (2021). "Corporate Liquidity and Solvency in Europe during COVID-19: The Role of Policies." IMF Working Paper 21/56.

Endresz, M., Harasztosi, P. and Lieli, R. P. (2015). "The Impact of the Magyar Nemzeti Bank's Funding for Growth Scheme on Firm Level Investment." MNB Working Papers 2015/2, Magyar Nemzeti Bank (Central Bank of Hungary)

Erhardt, E. C. (2017). "Microfinance beyond self-employment: Evidence for firms in Bulgaria." *Labour Economics*, 47(C): 75-95.

European Systemic Risk Board (2021). "Financial stability implications of support measures to protect the real economy from the COVID-19 pandemic." February 2021.

European Central Bank (2021). "The initial fiscal policy responses of euro area countries to the COVID-19 crisis." *Economic Bulletin* 1/2021, p. 80.

Fernández-Cerezo, A., González, B., Izquierdo, M. and Moral-Benito, E. (2021). "Firm-level heterogeneity in the impact of the COVID-19 pandemic." Working papers no. 2120.

Fernández-Cerezo, A., González, B., Izquierdo, M. and Moral-Benito, E. (2021). "The economic impact of COVID-19 on Spanish firms according to the Banco de España business activity survey (EBAE)." *Analytical Articles. Economic Bulletin* 1/2021 (25/02/2021).

France Stratégie. (2021). "Committee on the monitoring and evaluation of financial support measures for companies confronted with the COVID-19 epidemic - Progress report." *Inspection générale des finances & France Stratégie, présidé par Benoît Coeuré.*

Gonzalez, R.P. (2021). "Corporate bond issuance during the COVID-19 pandemic: a comparison with the global financial crisis." *Bank of Spain, Analytical Article*, 4/2021.

Gourinchas, P.O., Kalemli-Ozcan, S., Penciakova, V. and Sander, N. (2020). "COVID-19 and SME Failures." *CEPR Discussion Paper*, 15323.

Guipponi, G. and Landais, C. (2020). "Subsidizing Labor Hoarding in Recessions: The Employment & Welfare Effects of Short-Time Work," *CEPR Discussion Papers* 13310, Centre for Economic Policy Research (CEPR).

Hadjibeyli, B. Roulleau, G. and Bauer, A. (2021). "Live and (don't) let die: the impact of COVID-19 and public support on French firms." *Direction générale du Trésor Working Papers* 2021/2, Ministère de l'Économie, des Finances et de la Relance.

Harasztosi, P. and Savšek, S. (2021). "Productivity following the pandemic: initial firm-level evidence." *EIB Working Paper* forthcoming.

Harasztosi, P., Maurin, L., Pál, R., Revoltella, D. and Van der Wielen, W. (2021). "Policy support during the crisis: So far, so good?" *EIB Working Paper*, Forthcoming.

Horvath, A. and Lang, P. (2021). "Do loan subsidies boost the real activity of small firms?" *Journal of Banking & Finance*, 122(C), 105988.

Kalemli-Ozcan, S., Laeven, L. and Moreno, D. (2018). "Debt Overhang, Rollover Risk, and Corporate Investment: Evidence from the European Crisis." *NBER working paper* No. 24555.

Kopp, D. and Siegenthaler, M. (2019). "Short-Time Work and Unemployment in and after the Great Recession." *KOF Working Papers* 462, KOF Swiss Economic Institute, ETH Zürich.

Laeven, L., Schepens, G. and Schnabel, I. (2020). "Zombification in Europe in times of Pandemic." *VoxEU*, 11 October 2020.

Lalinsky, T. and Pal, R. (2021). "Efficiency and effectiveness of the COVID-19 government support: Evidence from firm-level data." *EIB Working Papers* 2021/06, European Investment Bank (EIB).

Lopez, J. A. and Speigel, M. M. (2021). "Small Business Lending Under the PPP and PPPLF Programs." *Federal Reserve Bank of San Francisco Working Paper* 2021-10, Federal Reserve Bank of San Francisco.

Lopez-Garcia, P. (2020). "Box 2 The impact on potential output of a surge in firm exits as a result of COVID-19" in eds. Bodnár, K., Le Roux, J., Lopez-Garcia, P. and Szörfi, B. "The impact of COVID-19 on potential output in the euro area." *ECB Economic Bulletin*, Issue 7/2020, European Central Bank (ECB).

Lydon, R., Mathä, T. Y., and Millard, S. (2019). "Short-time work in the Great Recession: firm-level evidence from 20 EU countries." *IZA Journal of Labour Policy*, 8(2): 1-29.

Maurin, L. and Pal, R. (2020). "Investment vs debt trade-offs in the post-COVID-19 European economy." EIB Working Paper Series, 2020/09.

Maurin, L. and Pal, R. (2021). "Corporate vulnerabilities after the COVID-19 crisis: which impact on bankruptcies?" EIB Working Paper Series, forthcoming.

McGowan, M. A., Andrews, D. and Millot, V. (2018) "The walking dead? Zombie firms and productivity performance in OECD countries." *Economic Policy*, Volume 33, Issue 96, October 2018, 685–736.

Musso, P. and Schiavo, S. (2008). "The impact of financial constraints on firm survival and growth." *Journal of Evolutionary Economics*, 18:135–149.

OECD (2021). "Strengthening Economic Resilience Following the COVID-19 Crisis A firm and industry perspective."

Rivera Garrido, B. and Maurin, L. (2021). "The cash conundrum: nature and implications for the post-COVID environment?" EIB Working Paper, forthcoming.

SME United (2021). "The SME business climate index and EU craft and SME barometer."

Teruel, M., Coad, A., Amaral-Garcia, S., Bauer, P., Domnick, C., Harasztosi, P. and Pál, R. (2021). "Productivity and HGEs: resilience and potential recovery from COVID-19 pandemic." EIB working paper, forthcoming.

Zimmermann, V. (2021). "Which enterprises have been hit hardest by the coronavirus crisis and what lessons can we learn from it?" KfW Research, Focus on Economics, no. 343, August 2021.