



# Financing Gaps of Companies during the Covid-19 Pandemic

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## JEL-Classification

E32 – Business Fluctuations, Cycles

E44 – Financial Markets and the Macroeconomy

E58 – Central Banks and Their Policies

## Summary

For firms' business and investment decisions their access to finance is a critical determinant. In times when access to finance becomes tight, corporations face either higher capital costs or they have to postpone their investment decisions when credit lines are not prolonged. Since business investment is a prerequisite to spur economic growth, access to finance is a critical variable in business cycle stabilization. Therefore, central banks take a close look at the financing conditions of companies, and they have to loosen monetary policy when access to finance becomes tighter. In contrast to the US, where firms rely to a great degree on capital market financing, euro area firms are dominantly funded by banks.

For our empirical analysis we use data from the Survey of Access to Finance of Small and Medium-sized Enterprises (SAFE) from the ECB. SAFE is a semi-annual survey and it covers the relevant data on financing conditions from the viewpoint of euro area firms with a focus on SMEs. The first wave started in the first half of 2009. Regression analyses with only three macroeconomic variables (yield on sovereign bonds, GDP growth and unemployment rate) on the percentage of vulnerable firms yield the result of a strong positive correlation with long-term interest rates. This effect is reduced when adding access to finance or the change in the external financing gap to the equation, which are also positively correlated to the vulnerability of SMEs. At the same time, the vulnerability of companies is negatively correlated with GDP growth indicating that in times of economic crisis, the vulnerability is higher than in times of economic boom. However, the coefficient loses its significance, when the change in the financing gap and access to finance were added to the regression. Since these two variables are also dependent on the business cycle, they better explain the vulnerability than GDP.

Summing up, we find some evidence for a transmission mechanism from yields on sovereign bonds to the vulnerability of companies. Thereby, the business cycle conditions worsen access to finance and the financing gap which both increase the vulnerability of firms. Monetary policy instruments that lower interest rates and enhance the supply of bank credit, such as the Long-term Refinancing Operations or the asset purchasing programs of the European Central Bank, have a positive impact on access to finance and the financing gap and thereby contribute to reducing the vulnerability of companies.

For the normalization of policy interest rates our results suggest that these should take place in an environment of robust economic growth for not worsening the vulnerability of companies. Given that inflation is already several percentage points above target, the ECB might be forced to act with more than a moderate interest rate increase. If we assume that the ECB might increase interest rate by 1.5 percentage points, the share of vulnerable SMEs increases to 5.5 percent. If this monetary policy reduces growth by one percentage point, we end up with a share of 5.9 percent of vulnerable companies. If GDP growth is reduced by three percentage points, the share of vulnerable SMEs increases to 6.7 percent. Given that the share of vulnerable companies during the Covid-recession and during the banking and sovereign debt crisis in the Eurozone was 10 percent and more, higher interest rates seem to be manageable by the ECB according to our estimates. However, things can become complicated as the current energy-crisis could introduce a recession in the Eurozone.

## 1 Introduction

For firms' business and investment decisions access to finance is a critical determinant. In times when access to finance becomes tight, corporations face either higher capital costs or they have to postpone their investment decisions when credit lines are not prolonged. Since business investment is a prerequisite to spur economic growth, access to finance is a critical variable in business cycle stabilization. Therefore, central banks take a close look at the financing conditions of companies, and they have to loosen monetary policy when access to finance becomes tighter. In contrast to the US, where firms rely to a great degree on capital market financing, euro area firms are predominantly funded by banks. This effect is also present because a substantial share of firms in the euro area are small and medium-sized enterprises (SMEs). The European Central Bank (ECB) conducts a semi-annual survey of SME on their access to finance (ECB, 2020). This dataset will be used in this study for analyzing how euro area SMEs were affected by the Covid-19 crisis, how monetary policy could have supported SMEs, and to what extent SMEs are affected by the upcoming rise in interest rates in the next months.

The Covid-19-pandemic has led to declining revenues especially in the service sector as households refrained from consuming goods and services which are associated with personal contacts, like transportation, accommodation, and leisure activities. Unusual to other recessions, in which the manufacturing sector's production is more volatile compared to the service sector's production, the Covid-19 related economic crisis hit especially the service sector. In contrast to the manufacturing sector with its large corporates, the service sector consists to a large degree of SMEs with smaller balance sheets, which were highly affected by declining revenues due to shop closures or declining demand. Thus, the pandemic caused the liquidity demand of these companies to increase since they had to cover their costs in times of declining or non-existent revenues. National governments responded to this crisis by expanding liquidity support to these SMEs by means of banks. Central banks, such as the ECB, helped banks to lend to companies in times of crisis by lowering financing conditions and providing liquidity to banks. Summing up, the policy objective was to secure access to finance for companies. However, the ECB did not support SMEs directly, but the Eurosystem lowered the yields on sovereign bonds, which serve as a benchmark for all the other interest rates in the banking sector. This, however, raises the question whether the monetary policy measures only provided favorable financing conditions for governments, or also for SMEs.

In crisis times, the number of firms becoming vulnerable increases. Firm vulnerability can be summarized by declining revenues and profits, increases in interest costs and an increase in indebtedness. Indebtedness is crucial here, because firms with higher debt levels have to deleverage during the recovery phase, but the deleveraging could also slow down growth, because firms delay profitable investment projects since paying down debt is more essential for them in restoring their credit assessment. In the aftermath of the debt crisis in the euro area, this deleveraging has led to a longer period of slow growth in the countries most affected by the crisis.

During the pandemic, companies also had to increase their indebtedness. The problem with this pandemic related debt is that these funds were not used for profitable investment, but for covering their costs in times of declining revenues. One question that arises here is, whether the current pandemic has made companies vulnerable to a similar degree as the debt crisis in the eurozone and whether companies will engage in a debt deleveraging before they can start to invest in profitable business opportunities. Whether the lower yields in

sovereign debt markets reduced the vulnerability of SMEs is key for their vulnerability during the recovery and the upcoming rise in interest rates.

There is already a body of research focusing on the impact of the pandemic to SMEs. OECD (2020) describes the pandemic as a combination of a supply-side and a demand-side shock. The supply-shock has reduced the supply of labor to companies through infections and quarantine as well as through shortages in parts and intermediate goods caused by lockdowns. The demand-shock has affected companies by a loss of demand and revenues causing liquidity shortages. Therefore, access to finance was key to the degree of vulnerability by companies. United Nations Global Impact (2020) has noted that there is no one-size-fits-all solution, since different categories of companies need different support measures. Hereby, the access to finance to SMEs is the biggest challenge.

Bartik et al. (2020) use a survey of 5800 small businesses in the US for an analysis of the impact of the first pandemic wave on small businesses. They find that SMEs were financially fragile with respect to the pandemic in that way that their liquid financial assets were depleted within two weeks for the median company. Cepel et al. (2020) employ an analysis of 1502 SMEs in the Czech Republic and the Slovak Republic. They find that more than one third of all SMEs regard financial risks as the most important business risk. This fraction increased to more than one half of all SMEs during the pandemic. Hossain et al. (2022) have found that cash-flow shortages and supply chain disruptions were critical constraints to SMEs. However, they find that SMEs could protect themselves from the pandemic through digitalization of their business model. EIB (2020) also recognizes that the pandemic as a sudden and dramatic change for SMEs. These companies were more heavily affected by the crisis, since they operate more labor-intensively, they have thinner liquidity reserves and less assets which can be used as collateral. Hurtley et al. (2021) found that SMEs in UK were hit harder than larger businesses. Therefore, they analyzed a dataset of 2 million SMEs of which younger SMEs in consumer-facing sectors faced the largest reduction in turnover during the pandemic. Klyver / Nielsen (2021) analyzed Danish SMEs during the pandemic. They found that innovation was key in overcoming the crisis. In order to maintain their innovation activities access to finance was key.

Within this report we go a step beyond these analyses and examine in more detail how the change in financing conditions in the sovereign bond market has affected firm vulnerability and their access to finance. Since sovereign yields serve as a benchmark for all other interest rates, they were the target of the European Central Bank's Pandemic Emergency Purchase Program (PEPP). With the help of our analysis one can find some indication of how monetary policy can support SMEs during tough times. In addition to that we get an indication about the effectiveness of the PEPP in not only preserving favorable financing conditions for governments, but also for supporting the access to finance for SMEs.

## 2 Data set

For our empirical analysis we use data from the Survey of Access to Finance of Small and Medium-sized Enterprises (SAFE) from the ECB. SAFE is a semi-annual survey and it covers the relevant data on financing conditions from the viewpoint of euro area firms with a focus on SMEs. The first wave started in the first half of 2009.

Within the survey, enterprises are categorized by their country of residence, their size, ranging from micro (1-9 employees) and small (10-49 employees) to medium-sized (50-249 employees) and large firms (250 or more employees) as well as four major economic sectors: industry, construction, trade, and services. The sample of the latest survey, conducted between 6<sup>th</sup> September 2021 and 15<sup>th</sup> October 2021 covers the period from April to September 2021, consists of data on 10 493 surveyed enterprises of which 67 percent are SMEs and 33 percent are large firms. In our analysis we will focus only on SMEs since it became apparent that they are the most vulnerable, especially in times of crisis.

SAFE contains variables which measure the vulnerability and profitability of companies. Vulnerable firms, on the one hand, are defined as those firms which reported that their turnover has declined, their profits have decreased and that their interest expenses as well as their debt-to-assets ratio remained unchanged or decreased over the past six months. On the other hand, profitable firms are defined in the SAFE as those companies which have reported higher turnover and profits as well as lower or unchanged interest expenses and debt-to-assets ratios than six months before. We use the data on the percentage of SMEs which SAFE classifies as vulnerable by this definition in our regression analysis to establish assumptions possibly driving the vulnerability of SMEs.

In order to assess the severity of concerns common for enterprises, SAFE asks them in the questionnaire to rate the following potential problems on a scale from one (not at all important) to 10 (extremely important): access to finance, availability of skilled staff and experienced managers, costs of production or labor, competition, regulation and finding customers. In the past, firms have been asked only to indicate their most pressing problem. Consequently, SAFE includes data on two types of measuring the pressingness of these problems: the average score, in the following referred to as “pressingness” and available since the first half of 2012, as well as the percentage of firms indicating the specific problem as most important, in the following referred to as “most pressing” and available since the first wave of SAFE. As the aim of this study is to evaluate the role of access to finance for the financial situation of SMEs, we include both types of measuring its severity in our regression, along with other potential problems as control variables.

A similar measure for access to finance which combines both the availability and need for external financing is the change in the external financing gap as perceived by euro area SMEs. In the SAFE, SMEs are asked to indicate whether the need and availability of each of the following types of financing improved, remained unchanged or deteriorated: bank loans, credit lines, trade credit, equity or debt securities at firm level. In aggregate, this produces an indicator between -1 (if availability increased and needs decreased) and 1 (if availability decreased and needs increased) indicating the change in the external financing gap of the respective instrument. The overall change in the external financing gap is the weighted average of the five financing gaps, multiplied by 100 to obtain weighted net balances in percentages. We include it as well in some regression specifications. It serves a similar role as access to finance, namely assessing the importance for SMEs of being able to access sufficient funds for their business.



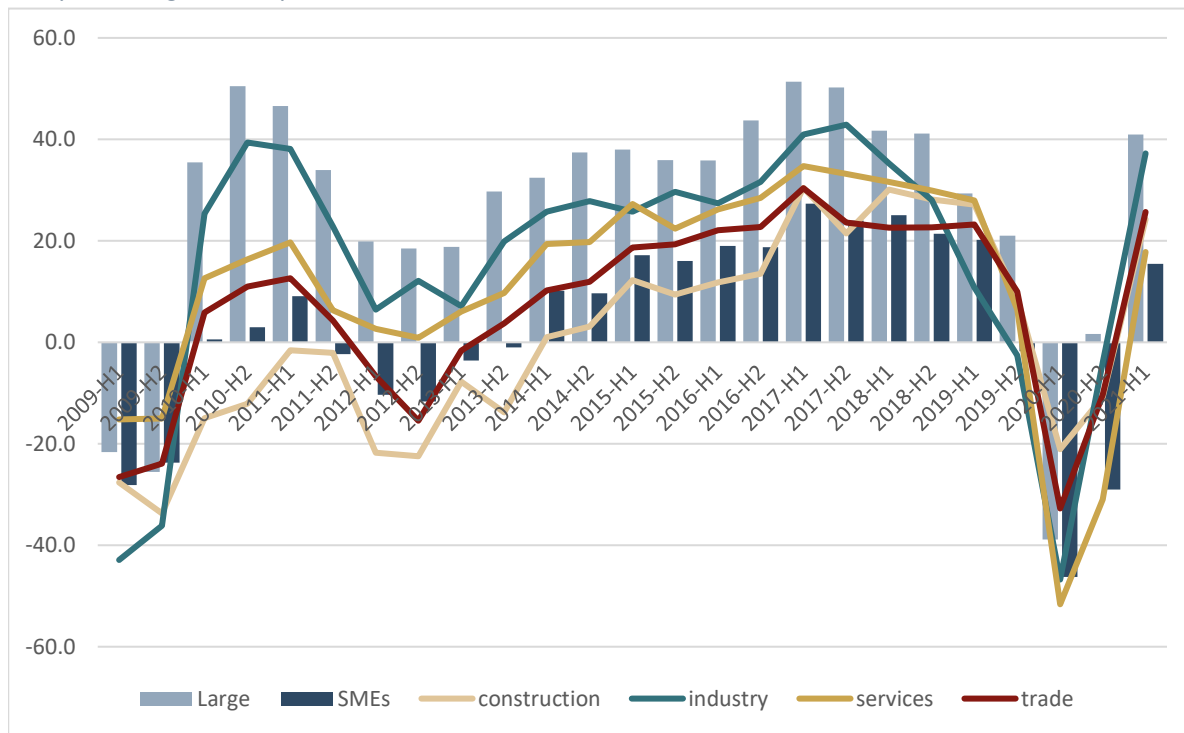
### 3 Euro area enterprises in the Covid-19 crisis

#### 3.1 The impact of the crisis on the financial situation of euro area enterprises

Enterprises of all sizes in the euro area were hit hard by the pandemic, while some companies were hit harder compared to others as noted in the studies cited above. Their financial situation deteriorated significantly in the beginning of 2020 as households began to distance socially which got hand in hand with a reduction in their purchases. The increase in household saving rates, a result of the social distancing, could be observed in the numbers from the first quarter of 2020. That SMEs were hit harder by the pandemic can be seen in figures 3-1 to 3-4.

**Figure 3-1: Change in turnover across euro area enterprises**

Net percentages of respondents <sup>1</sup>

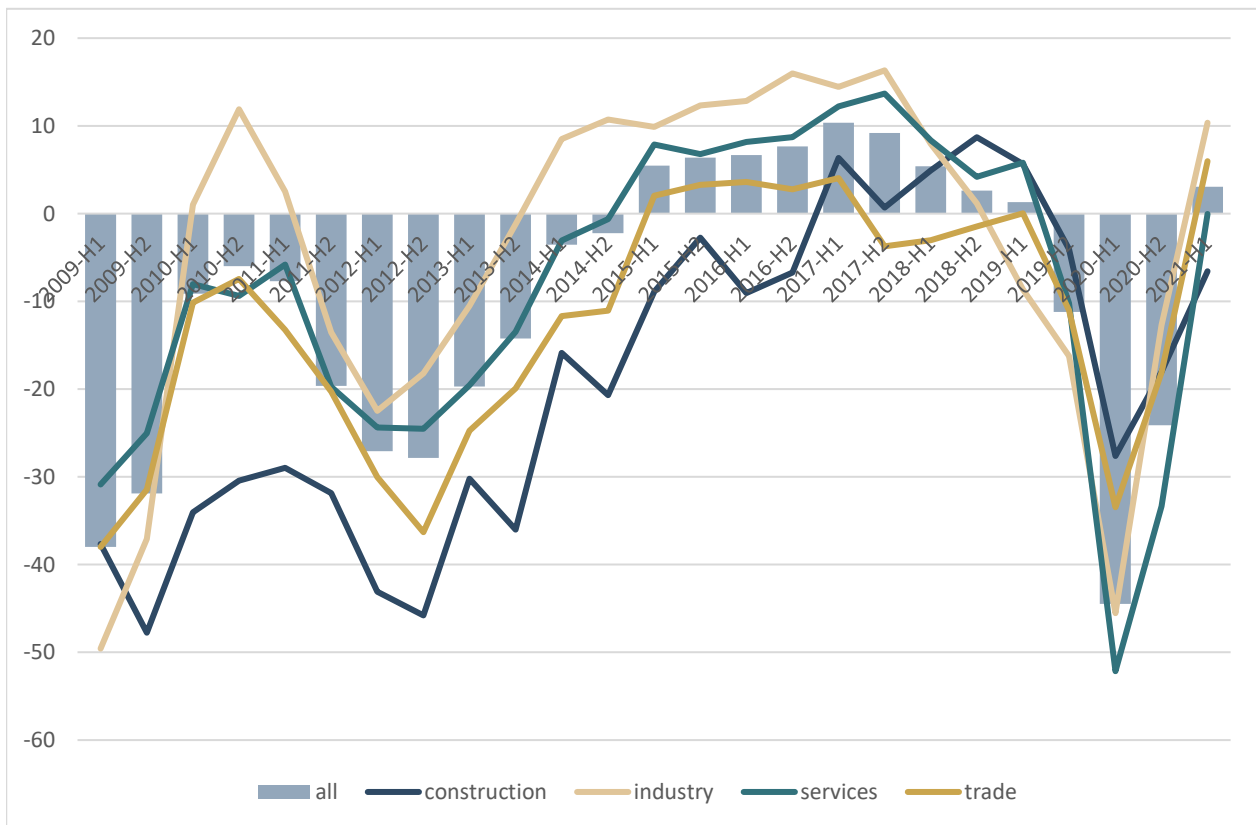
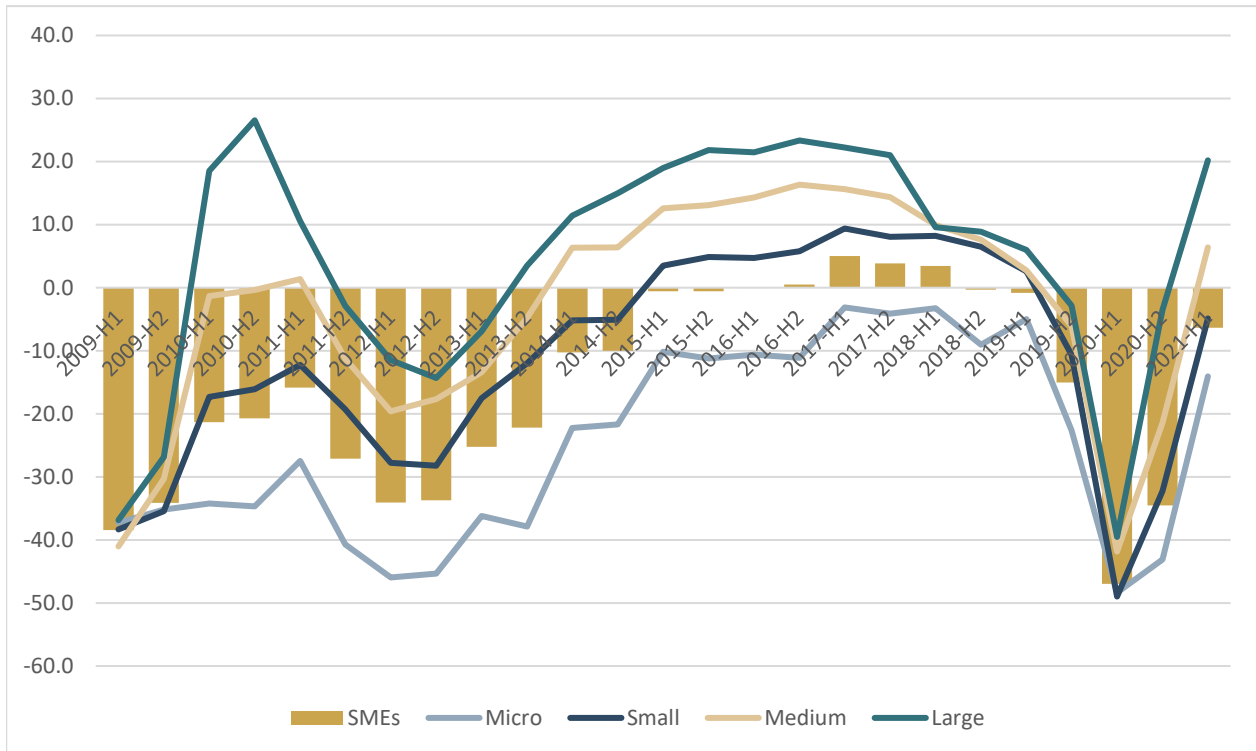


Source: SAFE November 2021

<sup>1</sup> Difference between the percentage of enterprises reporting an increase for a given factor and the percentage reporting a decrease

**Figure 3-2: Change in profits across euro area enterprises**

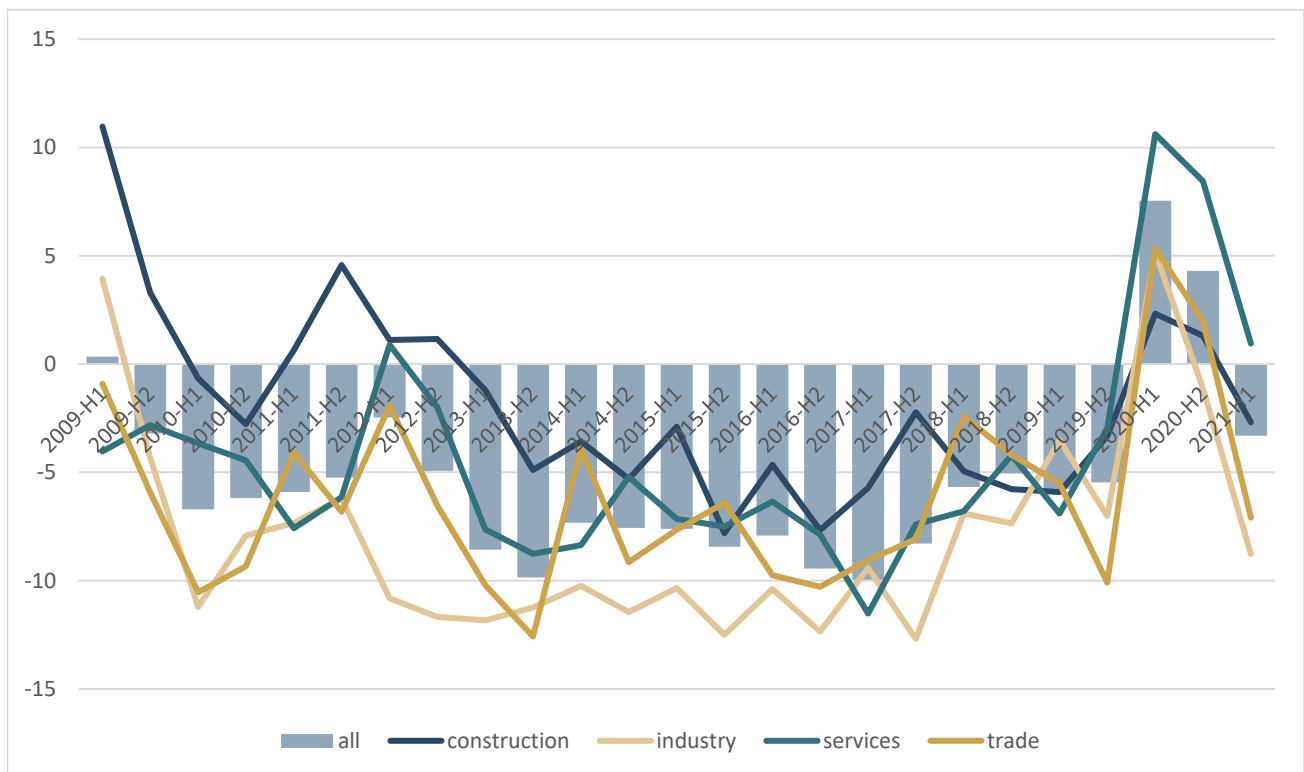
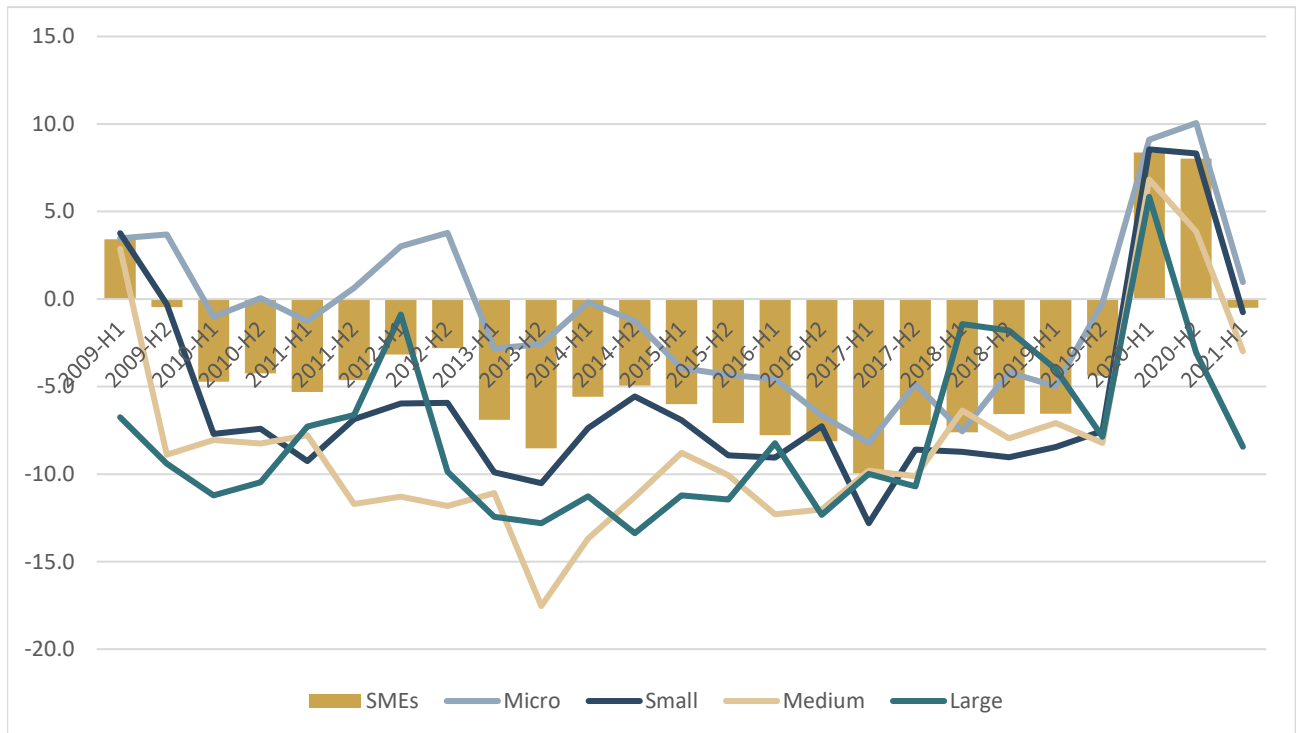
Net percentages of respondents



Source: SAFE November 2021

**Figure 3-3: Change in debt-to-assets ratio across euro area enterprises**

net percentages of respondents

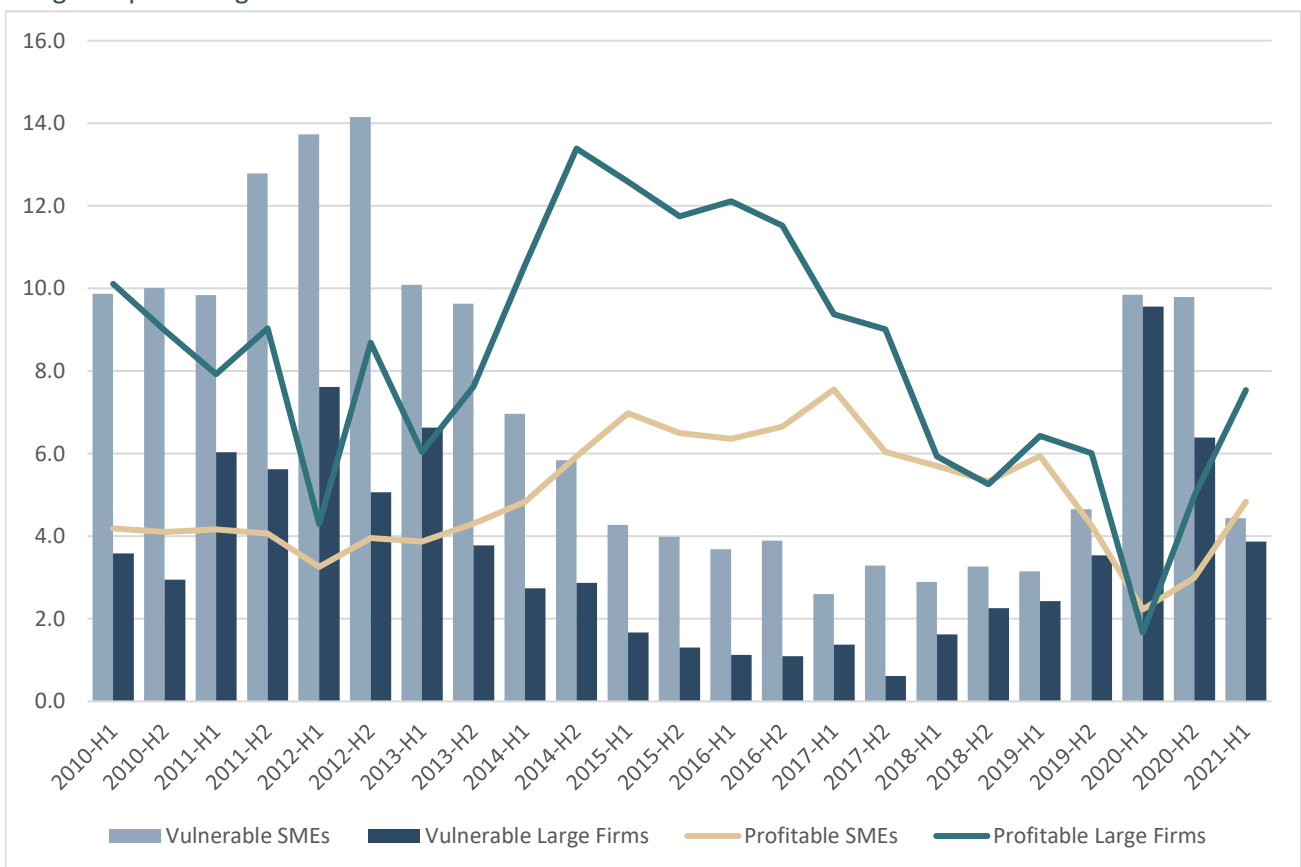


Source: Safe November 2021

All these developments can be captured with the vulnerability and profitability indicators from the SAFE. Figure 3-4 shows that after a sharp increase in vulnerable and a sharp decline in profitable companies in 2020, SMEs continue to be less profitable and more vulnerable than larger firms. This heterogeneity in the financial situation and resilience across firm sizes is crucial when assessing the impact of rising interest rates. Since SMEs in general seem to be affected much more severely from crises, we will focus exclusively on them in the following analysis.

**Figure 3-4: Vulnerable and profitable enterprises in the euro area**

Weighted percentages



Source: Safe November 2021

The financial situation of businesses determines their real decisions, thus having a major impact on growth prospects. The changes in real decisions of euro area firms, differentiating between SMEs and large firms. As indicated, their hiring and investment decision suffered significantly along with their financial situation during the crisis. Before recovering again in 2021, fixed investment, number of employees, inventories and working capital decreased significantly in 2020. The percentage of firms that reported such deteriorations was broadly similar between SMEs and large firms.

When asking SMEs about their perceived “pressingness” of common concerns, availability of skilled staff and experienced managers as well as finding customers are predominant. Although they seem to worry much less about access to finance in general, it is the only concern that worsened in 2020, indicating that it depends to a larger extent on crisis times than other potential issues. The numbers support the argument that companies rank this concern higher during crisis times as the numbers reached their maximum during the Euro

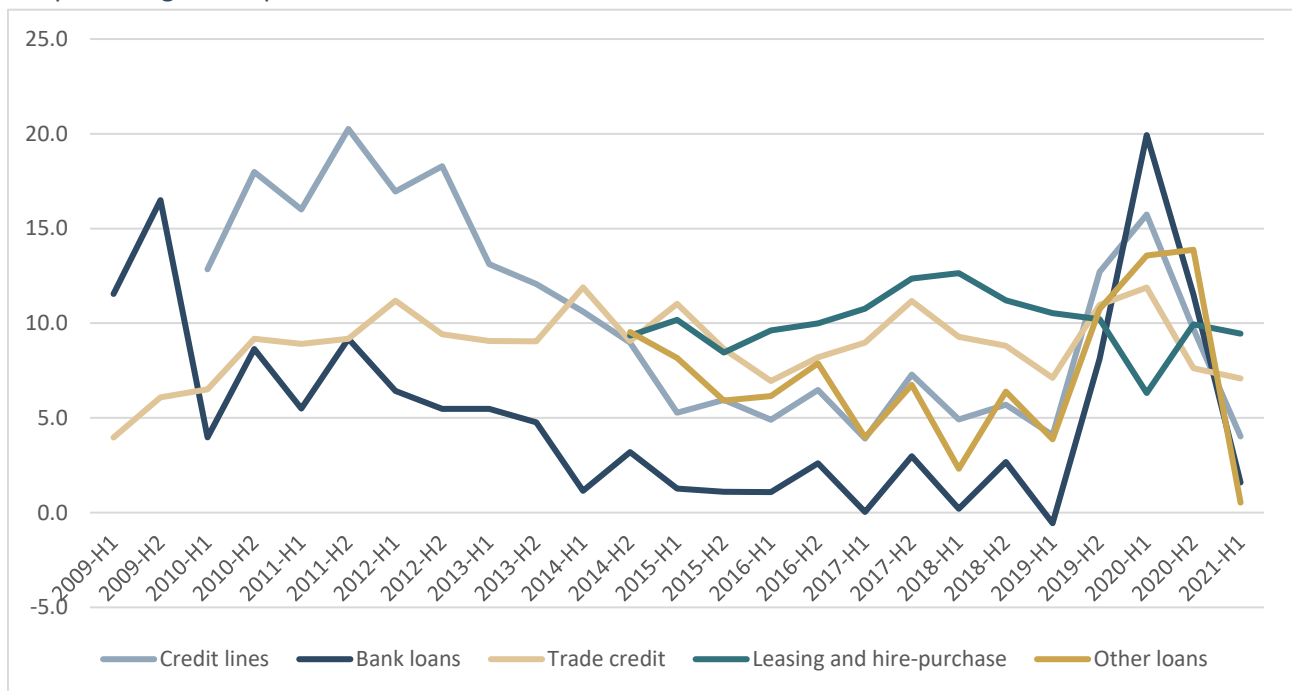
crisis and have been declining ever since. Furthermore, it is the only concern that can be influenced directly by monetary policy. While tackling other problems such as availability of skilled staff, finding customers or competition requires more complex and long-term approaches, access to finance can be navigated relatively easily via interest rates or provision of market liquidity. Therefore, it is of special interest in this analysis.

### 3.2 Financing during the pandemic

SMEs rely heavily on bank-related financing instruments such as bank loans, subsidized loans, credit lines or bank overdrafts as well as leasing or hire-purchase. More than 40 percent of euro area SMEs have reported to have used them during the past six months or consider them as relevant for their business in the second half of 2021 (figure 3-5). Factoring, equity and debt securities are much less important. This picture has not changed much since 2014. Only the use of subsidized loans increased significantly during the pandemic and has remained high.

**Figure 3-5: Change in External Financing Needs among Euro Area SMEs**

net percentage of respondents



Source: Safe November 2021

There is a substantial difference in financing between vulnerable and profitable companies. While the latter employ mainly credit lines, subsidized loans and bank loans, profitable firms resort more to hire-purchases and internal funds.

Since 2009, the overall main purposes of SMEs' external and internal funds have been fixed investment as well as inventories and working capital. During the pandemic, the amount employed for inventories and working capital as well as to refinance or pay off debt obligations increased. On the contrary, a lower amount was used for fixed investment, developing, and launching new products and services as well as the hiring and

training of employees. This indicates that during crises, SMEs tend to focus on their debt situation rather than investments for the future.

With the outbreak of the pandemic, the overall need for external financing rose sharply, especially for bank loans, but moderated quickly afterwards. Contrary to years before 2014, the overall availability of external financing increased slightly even during the pandemic but suffered a significant slow-down. Especially the perceived general economic outlook and firm-specific outlook deteriorated significantly. The overall adverse effects on the availability of external financing were limited largely by public financial support and banks' continued willingness to lend. SMEs indicated that government measures such as guarantees were crucial in meeting their short and medium-term obligations while they were not as important for large firms. Although the availability of external financing improved again in 2021, it has not reached pre-crisis levels yet. Nonetheless, the change in the external financing gap returned to positive levels in 2021, meaning that SMEs perceived the need for external financing to have grown slower than its availability in the second half of 2021. However, increasing gaps remain among SMEs in France, Greece, Belgium, and Portugal. Apart from regional heterogeneity, the change in the external financing gap also differs across firm sizes. Since 2009, it has been almost consistently highest among micro firms which are also the only ones still reporting an on average growing financing gap in the second half of 2021, whereas the gap decreased most among large firms.

## 4 Factors correlated with the vulnerability of SMEs

In order to assess efficacy of policy measures in helping SMEs during crises, it is crucial to analyze first the drivers of their vulnerability. Therefore, we conduct several regression analyses. Although we cannot establish causal relations, they are helpful in detecting overall relationships.

Although euro area SMEs on average do not report access to finance to be particularly pressing, it can be expected to affect their vulnerability significantly. Without access to finance, firms cannot invest which is indispensable for future growth. Furthermore, it is the only issue that has been reported to be more problematic during the Covid-19 pandemic when vulnerability rose significantly. Therefore, it is included as the main variable in our regression analysis while controlling for the other problems, macroeconomic factors, time-specific effects, and country-specific effects.

Our main regression results include robust standard errors to control for heteroscedasticity. Tables with clustered standard errors aimed at accounting for serial and cross-sectional correlation are included only in the appendix and must be interpreted with caution due to a low number of clusters on both country and time level.

All our three main variables of interest, namely long-term interest rates, access to finance and the change in the external financing gap seem to be somehow related to the percentage of vulnerable firms. However, the fact that they are also connected among each other makes it very difficult to establish concrete cause-effect relations. Nonetheless, our regressions revealed several interesting observations.

When we regress only the three macroeconomic variables (long-term interest rate, GDP growth and unemployment rate) on the percentage of vulnerable firms we find, as expected, a strong positive correlation with

long-term interest rates (table 4-1). The long-term interest rate is measured as the yield on sovereign bonds with a 10-year maturity and it serves as a proxy variable for the overall financing conditions in capital markets. It is not the individual interest rate on a company's loan, but a benchmark from the term structure of interest rates for the bank which supplies the loan to the company. Thus, when long-term interest rates increase also financing conditions for companies worsen via bank credit. This effect is reduced when adding access to finance or the change in the external financing gap to the equation, which are also positively correlated to the vulnerability of SMEs. These variables reflect more individual factors compared to the overall financing condition in capital markets as measures by the yield on sovereign bonds. When including the change in the external financing gap, the significance of long-term interest rates even disappears completely while it remains with access to finance.

**Table 4-1: Vulnerability of SMEs**

(problems measured by their average rating of perceived pressigness)

	<i>Dependent variable:</i>				
	Vulnerability				
	(1)	(2)	(3)	(4)	(5)
Long-term Interest Rate	0.738*** (0.240)	0.523*** (0.134)	0.465*** (0.110)	0.227 (0.241)	0.130 (0.188)
GDP Growth	-0.403*** (0.148)	-0.113 (0.070)	-0.074 (0.071)	-0.254** (0.121)	-0.054 (0.066)
Unemployment Rate	-0.104 (0.145)	0.193 (0.124)	0.125 (0.109)	-0.167 (0.142)	0.311*** (0.114)
Change in Financing Gap				0.332*** (0.039)	0.236*** (0.051)
Access to Finance		3.681*** (0.642)	3.056*** (0.926)		
Availability of Skilled Staff and Experienced Managers			-2.151*** (0.685)		-1.367* (0.698)
Costs of Production or Labour			0.664 (0.744)		0.365 (0.692)
Competition			-3.635*** (1.247)		-2.657** (1.104)
Regulation			2.859*** (0.951)		3.076*** (0.945)
Finding Customers			0.764 (0.709)		0.791 (0.692)
Observations	270	224	224	268	224
R <sup>2</sup>	0.223	0.369	0.472	0.429	0.505

Adjusted R <sup>2</sup>	0.102	0.260	0.363	0.337	0.404
F Statistic	22.232*** (df = 3; 233)	27.814*** (df = 4; 190)	18.357*** (df = 9; 185)	43.131*** (df = 4; 230)	20.987*** (df = 9; 185)

Source: own calculations based on SAFE November 2021

The vulnerability of companies is negatively correlated with GDP growth. Thus, in times of economic crisis, the vulnerability is higher than in times of economic boom. However, the coefficient loses its significance, when the change in the financing gap and access to finance were added to the regression. Since these two variables are also dependent on the business cycle, they better explain the vulnerability than GDP growth. The same is true when the unemployment rate is included in the regression. The coefficient is positive, but loses its significance, when access to finance is included in the regressions, since access to finance and the unemployment rate are affected by the business cycle. The variable reflecting the availability of skilled staff and experienced managers has a negative coefficient which is statistically significant. From this, however, no causal relationship could be inferred, since problems in finding staff makes companies more vulnerable, while being vulnerable also makes it harder for a company to provide job security and thus find staff. While the variable measuring the cost of production and labor is not significant, we find a positive and significant relationship with the variables measuring competition and regulation. For the variable measuring finding customers we do not find a statistically significant relationship. Summing up, vulnerability depends to a large degree on the state of the business cycle and the access to finance, which is also varying across the business cycle. Thus, central banks trying to ease financing conditions in recession times are enhancing access to finance for companies which reduces their vulnerability.

This picture does not change when the other five problems (availability of skilled staff and experienced managers, costs of production or labor, competition, regulation and finding customers) were included in the regression (tables 4-1 and 4-2).

**Table 4-2: Vulnerability of SMEs**

(problems as % of SMEs indicating them as most pressing)

	<i>Dependent variable:</i>				
	Vulnerability				
	(1)	(2)	(3)	(4)	(5)
Long-term Interest Rate	0.738*** (0.240)	0.526*** (0.139)	0.479*** (0.132)	0.227 (0.241)	0.266 (0.194)
GDP Growth	-0.403*** (0.148)	-0.205** (0.090)	-0.169* (0.087)	-0.254** (0.121)	-0.203* (0.109)
Unemployment Rate	-0.104 (0.145)	-0.550*** (0.106)	-0.476*** (0.112)	-0.167 (0.142)	-0.239** (0.119)



Change in Financing Gap			0.332***	0.237***
			(0.039)	(0.042)
Access to Finance	0.725***	0.516***		
	(0.081)	(0.085)		
Availability of Skilled Staff and Experienced Managers		-0.167***		-0.129**
		(0.052)		(0.058)
Costs of Production or Labour		-0.209***		-0.258***
		(0.073)		(0.080)
Competition		-0.373***		-0.444***
		(0.097)		(0.102)
Regulation		0.081		0.085
		(0.098)		(0.093)
Finding Customers		-0.049		-0.080
		(0.046)		(0.053)
Observations	270	268	268	268
R <sup>2</sup>	0.223	0.482	0.553	0.429
Adjusted R <sup>2</sup>	0.102	0.399	0.470	0.337
F Statistic	22.232*** (df = 3; 233)	53.545*** (df = 4; 230)	30.976*** (df = 9; 225)	43.131*** (df = 4; 230)
				28.394*** (df = 9; 225)

Source: own calculations based on SAFE November 2021

A potential problem with these regressions is that long-term interest rates can have a major impact on access to finance as well as the financing gap. That is why we also determine this relationship as depicted in tables 4-3 and 4-4. We use access to finance measured in the two ways defined before as the dependent variable in table 4-3. The change in the financing gap has a positive and significant impact. Thus, when financing gaps increase, access to finance is a larger problem for companies. We also find a positive and significant impact of long-term interest rates, but only in one specification. While higher interest rates are strongly associated with an increase in the external financing gap, the relationship to access to finance is less clear and only significant when measuring it as most pressing problem. This fits to the observation that the effect of long-term interest rates on the percentage of vulnerable SMEs remains significant with access to finance but not with the change in the external financing gap. Moreover, we find a negative impact of GDP growth and a positive impact of the unemployment rate which reflects the business cycle dependency of access to finance.

In table 4-4 we use the change in the financing gap as the dependent variable. The two variables measuring the access to finance are positively correlated with the financing gap in both specifications. Both coefficients are statistically significant. We also find that the long-term interest rates are positively correlated with the

change in the financing gap. The coefficient is also statistically significant. In times of increasing interest rates, the financing gap worsens, which also means that central banks can lower the financing gap by lowering interest rates. In addition to that GDP growth is negatively correlated with statistically significant coefficients, while we do not find a statistically significant relationship with the unemployment rate. However, the negative correlation with GDP growth shows that the financing gap is related to business cycle conditions. Since both, the coefficient of long-term interest rates is positive and significant and the coefficient of GDP growth is negative and significant, there are some doubts, that monetary policy in the eurozone is able to reduce all of the negative impact of recessions by lowering capital market interest rates.

Tables 4-3 and 4-4 also reveal a strong positive correlation between the change in the external financing gap and access to finance, supporting our assumption that they are in essence partly similar and should therefore not be included together in a regression.

All these observations suggest that long-term interest rates, access to finance and the change in the external financing gap all play a role for the vulnerability of SMEs. However, it seems as if the negative impact of an increase in the external financing gap and possibly also of a deterioration in access to finance originally generate from higher interest rates. Nonetheless, the pressingness of access to finance might be crucial on its own and not just be a channel for the effect of higher interest rates as it is strongly positively correlated with SMEs' vulnerability across all specifications and does only in part take away the effect of interest rates.

**Table 4-3: Access to Finance of SMEs**

	<i>Dependent variable:</i>							
	Access to Finance (pressingness)				Access to Finance (most pressing)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Change in Financing Gap	0.030*** (0.006)				0.303*** (0.033)			
Long-term Interest Rate		0.019 (0.022)	0.009 (0.023)	0.006 (0.024)		0.658*** (0.220)	0.286 (0.184)	0.226 (0.183)
GDP Growth			-0.017 (0.011)				-0.274** (0.125)	
GDP Growth II				-0.016* (0.009)				-0.235*** (0.082)
Unemployment Rate			0.015 (0.015)	0.014 (0.015)			0.620*** (0.119)	0.617*** (0.122)

Observations	224	224	224	224	268	268	268	268
R <sup>2</sup>	0.251	0.011	0.030	0.034	0.340	0.150	0.327	0.335
Adjusted R <sup>2</sup>	0.134	-0.143	-0.133	-0.128	0.244	0.026	0.222	0.231
F Statistic	64.552*** (df = 1; 193)	2.157 (df = 1; 193)	1.948 (df = 3; 191)	2.250* (df = 3; 191)	120.127*** (df = 1; 233)	41.266*** (df = 1; 233)	37.416*** (df = 3; 231)	38.730*** (df = 3; 231)

Source: own calculation based on SAFE November 2021

**Table 4-4: Change in the Financing Gap of SMEs**

	<i>Dependent variable:</i>				
	Change in Financing Gap				
	(1)	(2)	(3)	(4)	(5)
Access to Finance (pressigness)	8.258*** (1.166)				
Access to Finance (most pressing)		1.122*** (0.092)			
Long-term Interest Rate			1.739*** (0.224)	1.524*** (0.228)	1.394*** (0.226)
GDP Growth				-0.449*** (0.137)	
GDP Growth II					-0.437*** (0.114)
Unemployment Rate				0.200 (0.180)	0.201 (0.185)
Observations	224	268	268	268	268
R <sup>2</sup>	0.251	0.340	0.284	0.311	0.325
Adjusted R <sup>2</sup>	0.134	0.244	0.179	0.204	0.220
F Statistic	64.552*** (df = 1; 193)	120.127*** (df = 1; 233)	92.370*** (df = 1; 233)	34.773*** (df = 3; 231)	37.090*** (df = 3; 231)

Source: own calculations based on SAFE November 2021

**Table 4-5: Access to Finance and Financing Gap**

	<i>Dependent variable:</i>		
	Access to Finance (pressigness)	Access to Finance (most pressing)	Change in Financing Gap

	(1)	(2)	(3)	(4)	(5)	(6)
Public Financial Support	-0.003 (0.003)	-0.003 (0.003)	-0.026 (0.024)	-0.023 (0.023)	-0.035 (0.024)	0.039** (0.020)
Bank Credit	-0.010*** (0.004)	-0.014*** (0.005)	-0.171*** (0.023)	-0.101*** (0.034)	-0.242*** (0.030)	-0.316*** (0.030)
Trade Credit	0.008* (0.005)	0.001 (0.005)	0.027 (0.032)	0.010 (0.033)	-0.123** (0.048)	-0.054 (0.040)
Investors	-0.001 (0.003)	-0.004 (0.004)	-0.025 (0.021)	-0.066** (0.028)	0.004 (0.029)	-0.070** (0.029)
Credit History		-0.006 (0.008)		-0.012 (0.056)		-0.134** (0.068)
Economic Outlook	-0.002 (0.003)	0.004 (0.004)	0.041** (0.020)	0.009 (0.021)	-0.001 (0.027)	0.029 (0.025)
Firm Outlook	0.002 (0.004)	-0.002 (0.005)	0.035 (0.030)	0.069** (0.033)	-0.049 (0.042)	-0.169*** (0.036)
Firm Capital	-0.005 (0.005)	0.008 (0.005)	-0.052* (0.029)	0.009 (0.028)	0.043 (0.041)	0.218*** (0.034)
Observations	224	168	268	168	268	168
R <sup>2</sup>	0.233	0.249	0.464	0.252	0.743	0.825
Adjusted R <sup>2</sup>	0.085	0.071	0.370	0.074	0.698	0.784
F Statistic	8.119*** (df = 7; 187)	5.584*** (df = 8; 135)	28.122*** (df = 7; 227)	5.673*** (df = 8; 135)	93.703*** (df = 7; 227)	79.750*** (df = 8; 135)

Source: Own calculations based on SAFE November 2021

The measures so far included the perceived pressingness of potential problems and the change in the external financing gap, but SAFE also includes a question asking for changes in factors with an impact on the availability of external financing: general economic outlook, firm-specific outlook, firm credit history, willingness of business partners to provide trade credit, access to public financial support, firm's own capital, willingness of banks to lend and the willingness of investors to invest in the enterprise. During the pandemic, SMEs reported the most pronounced deteriorations for general economic outlook and firm-specific outlook while access to public financial support improved. Regressing these factors on access to finance and the change in the external financing gap gives us an idea of the extent to which these factors influence the availability of external financing. This is important to know since the availability of external financing both determines the pressingness of access to finance and the change in the external financing gap as perceived by SMEs which in turn are associated positively with their vulnerability. Table 4-5 shows the results for these regressions. For each dependent variable there is one specification with and without credit history because of data limitation for this factor. The result is clear: among all factors, only the willingness of banks to lend appears to positively affect both the access to finance and the change in the external financing gap across all specifications (Table 4-5). The coefficient of bank credit is negative and significant for all specifications, i.e. that improvements in bank credit reduced firms' financial problems. Since banks' willingness to lend tends to

decrease with higher interest rates, this supports the idea that interest rates indeed play an important role for the financial situation of SMEs whereas more general factors that are difficult to influence directly through policy measure such as general economic outlook or firm-specific outlook are less important. For trade credit a significant impact can only be found in one regression. Here, also an improvement reduces firms' problems. Moreover, we find that an improved credit history can reduce the financing gap. However, improved credit histories could also reflect the business cycle here. For public financial support we do not find any statistically significant relationship in none, but one regression. Here, we find a positive significant relationship. However, a reverse causality cannot be ruled out, i.e. that in situations, in which the financing gap widens, public support will be granted.

Summing up, we find some evidence for a transmission mechanism from the yields on sovereign bonds to the vulnerability of companies. Thereby, the business cycle conditions worsen access to finance and the financing gap which both increase the vulnerability of firms. A monetary policy that lowers interest rates and enhances the supply of bank credit has a positive impact on access to finance and the financing gap and thereby contributes to reducing the vulnerability of companies. From our results we conclude, that the PEPP did not only lower the financing costs for governments, but it also contributed to improving the access to finance for SMEs.

## 5 How will monetary normalization affect access to finance?

The analysis so far has provided us with evidence that the vulnerability of companies is related to their access to finance and the financing gap, which are highly dependent on the business cycle and the level of the long-term interest rate. Thus, in times of economic crises the vulnerability of companies increases.

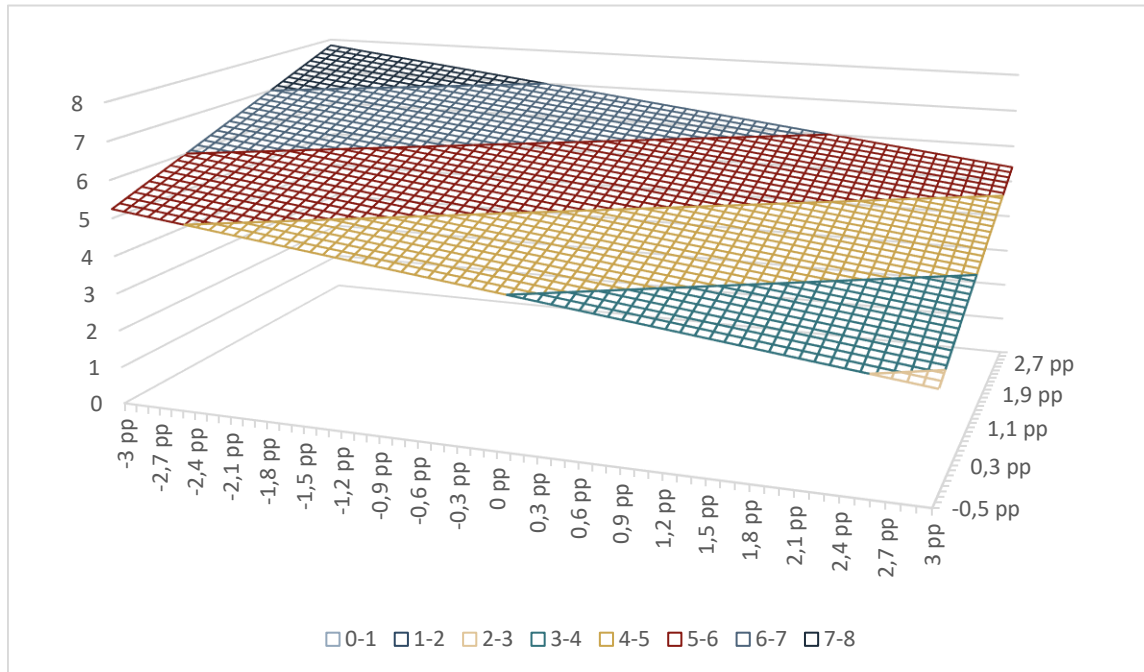
A monetary policy which lowers market interest rates and improves the availability of credit in times of economic crisis, such as the pandemic related recession of 2020, improves access to finance and the financing gap and thereby reduces the vulnerability of companies. From that point of view, the monetary policy during the pandemic contributed to prevent the vulnerability of companies deteriorate too much.

**Figure 5-1: Change in the share of vulnerable firms when interest rates increase**

x-axis: change in GDP-growth with respect to baseline in percentage points

y-axis: change in interest rates with respect to baseline in percentage points

z-axis: share of vulnerable SMEs in percent of all SMEs, baseline: value as of the first quarter of 2021



Source: own calculations based on Safe November 2021

As could be seen from the two 2011 rate hikes which triggered a recession in many eurozone countries, fighting inflation without reducing growth is no easy task. A more restrictive monetary policy will severely affect the number of vulnerable companies, which can be seen from the computations in figure 5-1. The share of vulnerable SMEs measured in the first half of the year 2021 in the Eurozone was 4.4 percent, which defines the baseline of our computations. From the regression results of table 4-2 we can see that an isolated change in interest rates of one percentage point increases the share of vulnerable companies by 0,7 percentage points, while an isolated change in GDP growth by one percentage point improves the share of vulnerable companies by 0.4 percentage points. Since a change in interest rates can slow down economic growth, we get a two-dimensional view on how interest rates changes affect the share of vulnerable SMEs. Figure 5-1 summarizes the scenarios in form of a surface. An increase in interest rates by 0.25 percentage points would increase the share of vulnerable companies from 4.4 percent to 4.6 percent, which seems to be a small increase. If the increase in interest rates leads to a decline in economic growth by 0.2 percentage points, the share of vulnerable companies would increase to 4.7 percent, which also seems to be a kind of small increase.

But what about larger interest rate increases? The monetary policy measures analyzed and discussed so far have taken place in an environment of low inflation. A question which arises now is, how higher inflation and thereby higher interest rates will affect the vulnerability of companies. The most recent inflation surge has opened discussions as to which the ECB has to toughen its monetary policy. As can be seen from our regressions, higher interest rates would worsen the vulnerability of companies. But we also found out, that higher GDP growth would improve the vulnerability of companies. Thus, for the ECB to increase interest rates without making companies too vulnerable to deteriorate financing conditions, it has to increase interest rates in

an environment with strong enough GDP growth. This provides the ECB with a trade-off between acting early and acting late, while acting late bears the risk that inflation will become persistent and interest rates have to increase even more in order to bring inflation back to target. Given that inflation is already 5 percentage points above target, the ECB might be forced to act with more than a moderate interest rate increase. If we assume that the ECB might increase interest rate by 1.5 percentage points, the share of vulnerable SMEs increases to 5.5 percent. If this monetary policy reduces growth by one percentage points, we end up with a share of 5.9 percent of vulnerable companies. If GDP growth is reduced by three percentage points, the share of vulnerable SMEs increases to 6.7 percent. Given that the share of vulnerable companies during the Covid-recession and during the banking and sovereign debt crisis in the Eurozone was 10 percent and more, higher interest rates seem to be manageable by the ECB. However, things can become complicated as the current energy-crisis could introduce a recession in the Eurozone.

## Literature

Bartik, Alexander / Bertrand, Marianne / Cullen, Zoe / Stanton, Christopher, 2020, The Impact of COVID-19 on Small Business Outcomes and Expectations, Proceedings of the National Academy of Sciences, Vol. 117(30), 17656-17666, <https://doi.org/10.1073/pnas.2006991117> [retrieved on 25th of May, 2022]

Cepel, Martin / Gavurova, Beata / Dvorsky, Jan / Belas, Jaroslav, 2020, The Impact of the COVID-19 Crisis on the Perception of Business Risk in the SME Segment, Journal of International Studies, Vol. 13, No. 3, DOI: 10.14254/2071-8330.2020/13-3/16 [retrieved on 25th of May, 2022]

ECB – European Central Bank, 2021, Survey on the Access to Finance of Enterprises in the Euro Area, [https://www.ecb.europa.eu/stats/ecb\\_surveys/safe/html/ecb.safe202111~0380b0c0a2.en.html](https://www.ecb.europa.eu/stats/ecb_surveys/safe/html/ecb.safe202111~0380b0c0a2.en.html) [retrieved on 25th of May, 2022]

EIB – European Investment Bank, 2020, Does This Change Everything? Small Business Gets Sick, <https://www.eib.org/en/stories/smes-coronavirus> [retrieved on 25th of May, 2022]

Hossain, Mohammad / Akhter, Fahmida / Sultana, Mir, 2022, SMEs in Covid-19 Crisis and Combatting Strategies: A Systematic Literature Review (SLR) and A Case from Emerging Economy, Operations Research Perspectives, Volume 9, <https://doi.org/10.1016/j.orp.2022.100222> [retrieved on 25th of May, 2022]

Hurley, James / Karmakar, Sudipto / Markoska, Elena / Walczak, Eryk / Walker, Danny, 2021, Impacts of the Covid-19 Crisis: Evidence from 2 Million UK SMEs, Bank of England Staff Working Papers No. 924, <https://www.bankofengland.co.uk/working-paper/2021/impacts-of-the-covid-19-crisis-evidence-from-2-million-uk-smes> [retrieved on 25th of May, 2022]

Klyver, Kim / Nielsen, Suna, 2021, Which Crisis Strategies are (Expectedly) Effective among SMEs during COVID-19?, Journal of Business Venturing Insights, Volume 16, <https://doi.org/10.1016/j.jbvi.2021.e00273> [retrieved on 25th of May, 2022]

OECD, 2020, Coronavirus (COVID-19): SME policy responses, <https://www.oecd.org/coronavirus/policy-responses/coronavirus-covid-19-sme-policy-responses-04440101/> [retrieved on 25th of May, 2022]

United Nations Global Compact, 2020, Helping Small Businesses Survive COVID-19, <https://unglobalcompact.org/academy/%20helping-small-businesses-survive-covid-19> [retrieved on 25th of May, 2022]