

Gropp, Reint; Koetter, Michael; McShane, William

Research Report

The Corona recession and bank stress in Germany

IWH Online, No. 4/2020

Provided in Cooperation with:

Halle Institute for Economic Research (IWH) – Member of the Leibniz Association

Suggested Citation: Gropp, Reint; Koetter, Michael; McShane, William (2020) : The Corona recession and bank stress in Germany, IWH Online, No. 4/2020, Leibniz-Institut für Wirtschaftsforschung Halle (IWH), Halle (Saale)

This Version is available at:

<https://hdl.handle.net/10419/222304>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



Halle Institute for Economic Research
Member of the Leibniz Association



IWH Online

4/2020

July 2020

Reint E. Gropp, Michael Koetter, William McShane

 The Corona Recession and Bank Stress in Germany

Imprint

The IWH Online series publishes work by IWH scientists with the least possible delay and free of charge. The series includes preliminary reports, studies, analyses and surveys.

Contact

Professor Reint E. Gropp, PhD

Tel +49 345 77 53 727

Fax +49 345 77 53 820

E-mail: reint.gropp@iwh-halle.de

Authors

Reint E. Gropp

Michael Koetter

William McShane

Issuer

Halle Institute for Economic Research (IWH) –
Member of the Leibniz Association

Executive Board

Professor Reint E. Gropp, PhD

Professor Dr Oliver Holtemöller

Dr Tankred Schuhmann

Address

Kleine Maerkerstrasse 8

D-06108 Halle (Saale), Germany

Postal Address

P.O. Box 11 03 61

D-06017 Halle (Saale), Germany

Tel +49 345 7753 60

Fax +49 345 7753 820

www.iwh-halle.de

All rights reserved

Citation

Reint E. Gropp, Michael Koetter, William McShane: The Corona Recession and Bank Stress in Germany.
IWH Online 4/2020. Halle (Saale) 2020.

ISSN 2195-7169

The Corona Recession and Bank Stress in Germany

Halle (Saale), 06.07.2020

The Corona Recession and Bank Stress in Germany

Abstract

We conduct stress tests for a large sample of German banks across different recoveries from the Corona recession. We find that, depending on how quickly the economy recovers, between 6% to 28% of banks could become distressed from defaulting corporate borrowers alone. Many of these banks are likely to require regulatory intervention or may even fail. Even in our most optimistic scenario, bank capital ratios decline by nearly 24%. The sum of total loans held by distressed banks could plausibly range from 127 to 624 billion Euros and it may take years before the full extent of this stress is observable. Hence, the current recession could result in an acute contraction in lending to the real economy, thereby worsening the current recession, decelerating the recovery, or perhaps even causing a “double dip” recession. Additionally, we show that the corporate portfolio of savings and cooperative banks is more than five times as exposed to small firms as that of commercial banks and Landesbanken. The preliminary evidence indicates small firms are particularly exposed to the current crisis, which implies that cooperative and savings banks are at especially high risk of becoming distressed. Given that the financial difficulties may seriously impair the recovery from the Covid-19 crisis, the pressure to bail out large parts of the banking system will be strong. Recent research suggests that the long run benefits of largely resisting these pressures may be high and could result in a more efficient economy.

Introduction

Covid-19 and the associated social distancing measures have resulted in an enormous shock to economic activity. The official forecast for the German economy, which is regularly prepared by the Halle Institute jointly with four other institutes suggests that the Germany economy is likely to have declined by 9.8% over the second quarter of 2020 and to decline by 4.2% over the whole year. While the 2008/2009 recession started with a financial crisis that spread to the real economy, the current crisis originates in the real economy. In 2008/2009 internationally active banks, such as large commercial banks and Landesbanken, were particularly exposed to the mortgage-backed securities market and were forced to contract lending. Today, the concern is that the reverse could occur. The current recession may transmit to the banking sector if stressed firms fail to make their debt payments, thereby increasing non-performing loans that have to be absorbed by banks' capital. As argued in Gropp, Koetter, and McShane (2020),¹ deteriorating capitalisation, possibly even below the regulatory minimum, would force banks to contract the loan supply with adverse effects on the real economy, most likely extending and deepening the crisis.

So far, the IWH Bankruptcy Research Unit has observed a small uptick in bankruptcies, with larger firms going into default in the month of May 2020 than in normal times.² Still, given the severe drop in GDP, the wave of defaults to come is likely to be large even with government assistance.³ Using

¹ Reint E. Gropp, Michael Koetter, William McShane: [Transmitting Fiscal Covid-19 Counterstrikes Effectively: Mind the Banks!](#) IWH Online 2/2020. Halle (Saale) 2020.

² <https://www.iwh-halle.de/nc/en/press/press-releases/detail/iwh-bankruptcy-update-increase-in-large-firm-bankruptcies/>.

³ <https://www.economist.com/business/2020/05/16/a-wave-of-bankruptcies-is-coming-in-europe>.

data from past recessions, previous research finds that a 2.7 percentage point decline in GDP causes a 0.4 percentage point increase in nonperforming loans⁴ (NPL) in the first year and a 1.7 percentage point increase in NPL four years later. Hence, the speed at which a crisis in the real economy transmits to the financial sector is generally significantly slower than the other way around.

While a significant lag in observable NPL may seem surprising, the process through which a loan becomes 90 days past due can be lengthy for the following reasons. First, because default is costly, firms are likely to view default as a last resort. A firm facing a shock to its cash flow may continue to make debt payments by using cash holdings, cutting spending, selling off assets, or seeking alternative sources of finance in the hopes that demand will soon improve. Second, it is trivial that a firm can fail to make debt payments for three months before their debt is accounted as an NPL. Finally, banks may have incentives to delay a troubled loan from becoming an NPL on their balance sheet in order to avoid unwanted scrutiny from regulators and investors. More precisely, banks may evergreen troubled loans by extending credit to otherwise insolvent borrowers so that they can keep their loans current. By tying up credit, evergreening can result in the transmission of balance sheet stress to the real economy even before NPL are realised as the supply of credit is misallocated from new lending toward weak, unproductive firms.

These facts are consistent with the dynamic of NPL shares observed in Greece, Italy, Portugal, and Spain following the financial crisis (see Figure 1). Although the financial crisis had by all accounts reached Europe by 2008, the NPL share in Greece, Italy, Portugal, and Spain did not peak until 2017, 2014, 2015, and 2013, respectively. Steinkamp, Tornell, and Westerman (2018) find that proxies for evergreening rose sharply in these countries immediately following the onset of the financial crisis. While the financial crisis and the following European debt crisis were clearly distinct from the Corona crisis in nature and duration, it is indicative of the prolonged process through which shocks manifest observably in banks' balance sheets.

A simple linear extrapolation of Nkusu's (2011) results and the forecast suggest aggregate NPL in Germany may increase by 2.64 percentage points after four years. Hence, Germany's NPL ratio would be 17.2% higher than its peak during the 2008/2009 financial crisis. Moreover, the projected decline in GDP of 4.2% depends on a robust rebound in the third quarter. Given the potential for the virus and accompanying global lockdown measures to return in force, the decline in GDP and thereby NPL could well exceed these forecasts.

Further, these aggregates obscure heterogeneity in the severity of banks' exposure to the coronavirus recession. It is worth remembering that the aggregate exposure of Germany's banking sector to US mortgage-backed securities was small. However, because these exposures were concentrated among a small number of Landesbanken and commercial banks, this financial stress was sufficient to spill over into the real economy.

Some sectors, such as ICT and real estate, are forecasted to be largely spared from the recession, with positive albeit weak growth forecasted for 2020. Other sectors, such as the hospitality, tourism and retail sectors, are forecasted to see collapses in economic activity of nearly 10%. As banks tend to specialise in lending to specific product markets⁵, there is likely to be large heterogeneities in banks' exposure to declines in borrowers' cash flows due to Covid-19.

⁴ Defined as a loan whose payment of interest and principal are past due by 90 days or more.

⁵ See Paravisini, Rappoport, Schnabl (2018); De Jonghe et al. (2019); Saidi, Streitz (2020).

We conduct simple stress tests to estimate the potential for the Corona recession to result in a banking crisis in Germany under three different business cycle scenarios for 2020. The first scenario corresponds to the forecast of the “Gemeinschaftsdiagnose” (Joint Economic Forecast) and can be roughly viewed as predicting a “V-shaped” business cycle in which, after a severe drop, economic activity booms in the latter half of 2020. We view this scenario as realistic, but also perhaps optimistic. In this forecast, as an example, the business services sector grows by a remarkable (non-annualised) 24.2% in the third quarter. A second plausible scenario would be a “U-shaped” business cycle in which economic activity resumes only slowly after reaching the trough. Finally, economic activity in 2020 could be described as an “L,” in which the economy remains around its trough in the cycle for an extended period of time.

We forecast that even in the more optimistic “V-shaped” scenario, nearly 6% of banks in our sample will have Tier 1 capital ratios below 6%. Jointly, these banks hold approximately 7% of the total loans covered by the sample. Even this more optimistic scenario would likely result in an acute contraction in lending to the real economy, thereby worsening the current recession or perhaps even causing a “double dip” recession. Things become even more dire in the “U-” and “L-shaped” scenarios in which the share of loans held by distressed banks reaches 11.8% and 28.3% respectively. Indeed, the “L-shaped” scenario sees over 5% of banks have their Tier 1 capital wiped out entirely.

These calculations are however subject to a large degree of uncertainty. The size and duration of government rescue programmes, the speed of the economy’s recovery, the magnitude of the downturn, and data limitations all place uncertainty on our forecasts. What these results do show is that a banking crisis due to the Corona recession is at least a plausible scenario. Given that a number of European economies have similar levels of bank capitalisation to Germany, these results might also suggest that a banking crisis is a plausible scenario elsewhere in the Eurozone.

Sample and Methodology

First, we link over 547,000 German (including small and medium) enterprises to a sample of 1,070 German banks for which we have coverage of risk-weighted assets, Tier 1 capital, gross loans, and nonperforming loans in Bankfocus. Our sample of banks covers roughly 89% of savings banks, 81% of cooperative banks, and 3 of the 5 Landesbanken, in addition to the Zentralgenossenschaftsbank and 15 commercial banks. The group of commercial banks includes large systemically important banks such as Deutsche Bank and Commerzbank, in addition to a number of small domestic commercial banks.

With these data, we measure the exposure of each banks’ corporate loan portfolio to industry-specific changes in GDP over 2020 forecasted by the Gemeinschaftsdiagnose, along with alternative business cycle outcomes (see Table 1). As we cannot measure the extent to which each bank lent to each firm, we weigh each bank-firm lending relationship by firm assets when constructing corporate loan portfolios. We then linearly extrapolate an elasticity of an aggregate change in NPL given a change in GDP from the literature to forecast the increase in NPL of each bank’s balance sheet. We use Nkusu’s (2011) estimates of an elasticity of 0.63 over four years from a vector autoregressive model for sample of advanced economies. Adding this simulated NPL increase to the latest available NPL values, we deduct our NPL estimates from bank Tier 1 capital and risk-weighted assets to forecast banks’ capitalisation.

Table 2 provides statistics on Tier 1 capital to risk-weighted assets ratios, total assets, and nonperforming loans for commercial, cooperative, savings, and head institution banks separately. One first

observation is that banks in this sample are well capitalised. For each bank type, the mean Tier 1 capital ratio is approximately 16%. Moreover, the mean NPL share of these banks is just 2% to 3%. These descriptive statistics are suggestive of a banking system able to withstand normal shocks to economic activity, consistent with the results of the ECB's 2019 stress test.⁶

Results and Discussion

Table 3 displays sample mean Tier 1 capital ratios and NPL shares simulated across business cycle scenarios. Across different sectors of the German banking system, each sector experiences a mean increase in NPL share of approximately 2 percentage points in the “V-shaped” simulation – representing a nearly 93% increase for the whole sample. However, the average bank in the “V-shaped” simulation is still able to withstand this shock, with mean Tier 1 capital ratios ranging from 10% to 13% across the banking sector. The same holds true under a “U-shaped” simulation. Only the most acute “L-shaped” scenario results in the average commercial bank being on the brink of distress.

However, heterogeneity in exposure to different corporate sectors means that even in our more optimistic scenario, a non-trivial share of banks are likely to be in distress. Figure 1, a histogram of the distribution of current and simulated NPL shares and Tier 1 capital ratio, shows that over 6% of banks are likely to have Tier 1 capital ratios below 6% in every simulation. Indeed, we find that seven banks (six cooperative banks and one commercial bank) have their capital essentially completely wiped out, with a Tier 1 capital ratio of under 1% in the “V-shaped” simulation. By comparison, 11.8% and 28.3% of banks in the “U-” and “V-shaped” scenarios, respectively, are projected to have Tier 1 capital ratios below the regulatory minimum. Worse, over 5% of the entire sample has its capital wiped out entirely in the “L-shaped” scenario.

Taking a closer look at the extent of distress, Table 4 shows the share of banks with simulated Tier 1 capital ratios below 6% and the share of each banking sector's total loans held by such banks. We observe that 7.1%, 10.2%, and 29.3% of loans are held by distressed banks in the “V-”, “U-”, and “L-shaped” projections, respectively. Clearly, the “L-shaped” scenario would be disastrous for the banking sector. It is difficult to imagine a scenario where close to a third of all loans are held by banks in distress that does not result in a recession lasting multiple years.

Note that it is likely that these forecasts underestimate the extent to which the corona recession will impact savings and cooperative banks in particular. This is for the simple reason that compared to large banks, small banks are more exposed to small firms. We estimate that at least 36% and 23% of cooperative and savings' aggregate corporate credit consists of loans to firms with less than 50 employees. In contrast, less than 4% of commercial banks' and head institutions' corporate loan portfolios consists of credit to small firms in our sample.⁷ As small firms are less well covered than large firms in our dataset, these estimates are almost certainly a lower bound, but they do illustrate large discrepancies in the importance of small firms along bank type.

⁶ https://www.bankingsupervision.europa.eu/press/pr/date/2019/html/ssm.pr191007_annex~537c259b6d.en.pdf.

⁷ We infer these values by examining the sum of total assets by firm size and bank-firm relationships. While firms' assets are an imperfect substitute for firm debt, coverage of debt in our sample is comparably poor and the correlation coefficient for firm debt and assets is 0.94.

Data on the severity of the shock by firm size is still scarce. However, there is good reason to believe the severity of the shock is inversely related to firm size. ADP and Gusto, large US-based digital payroll providers, have both observed far greater job losses among small businesses than among large businesses.⁸ An April survey of 5,800 American small businesses conducted by Bartik et al. (2020) observed a 40% decline in employment relative to January, the national aggregate. The authors further note that most small businesses' cash holdings amount to less than one month in expenses as of April, which does not bode well for their ability to make loan payments. Just as heterogeneity in borrower sectors is likely to result in some banks being far more exposed than others, differences in borrowers with respect to firm size is likely to be an additional driver of bank stress.

Conclusion

We conduct three different stress tests of varying severity for a large and representative sample of German banks. We find that even in a more optimistic “V-shaped” scenario, the Corona recession could spill over into the banking sector with enough banking going into distress to result in an aggregate decline in the supply of credit. In the least optimistic “L-shaped” scenario, over 1 in 20 banks have their capital wiped out entirely. This indicates that the potential for a banking crisis to exasperate the current recession, decelerate the recovery, or result in a “double-dip” recession should be of first-order concern for policy makers. Further, it may take years before the magnitude of the stress in the banking sector is fully observable.

Given that the financial difficulties may seriously impair the recovery from the Covid-19 crisis, the pressure to bail out large parts of the banking system will be strong. Recent research suggests that the long run benefits of largely resisting these pressures may be high and could result in a more efficient economy.⁹ Nevertheless, preparations in the European System of Central Banks and in national governments should start now to prepare for potential widespread financial instability not only in Germany but also in other European countries hit hard by the crisis.

Similarly, financial regulators should be alert to attempts by banks to hide their NPL through evergreening. A large body of research finds that the prevalence of subsidized debt to otherwise insolvent firms results in a misallocation of capital and weaker business dynamism.¹⁰

Furthermore, we anticipate that our simulation will underestimate the importance of the Corona recession for savings and cooperative banks, whose lending is concentrated among smaller firms that are particularly hit by the lockdown measures in response to the virus. Given that small banks provide credit disproportionately to small firms, one should be prepared for a “too many to fail” problem perhaps more than for a “too big to fail” problem.

⁸ <https://gusto.com/company-news/covid-19-small-business-trends-march-2020>;
<https://adpemploymentreport.com/>.

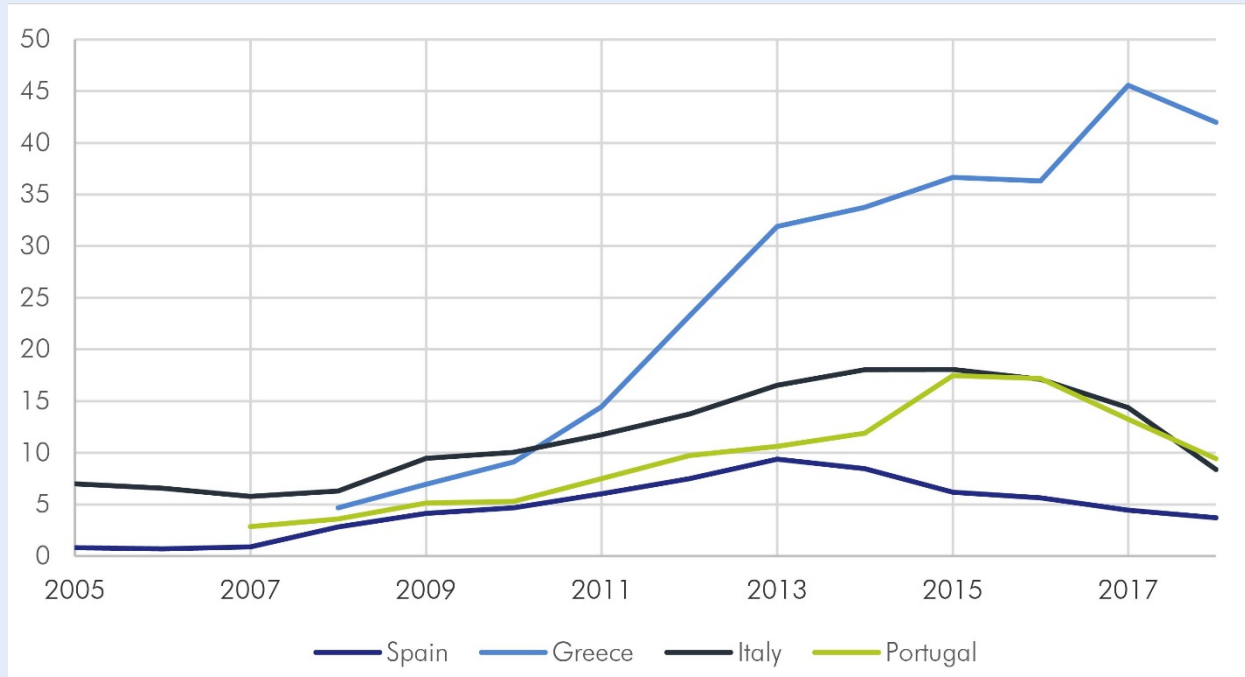
⁹ See Gropp, Ongena, Rocholl, Saadi: The Cleansing Effect of Banking Crises. Mimeo, 2020, Halle Institute for Economic Research (IWH).

¹⁰ See Cabarelo, Hoshi, and Kashyap (2008), Peek and Rosengren (2005), McGowan, Andrews, and Millot (2017).

Figures

Figure 1

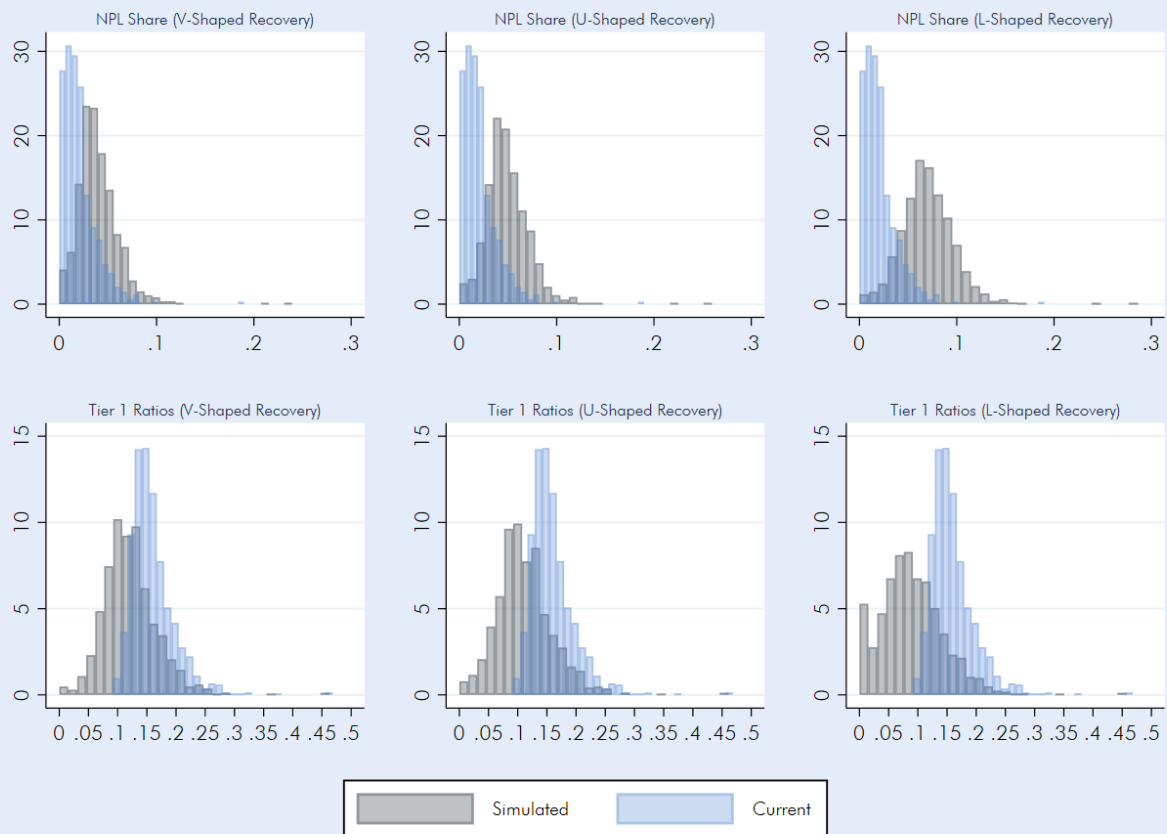
Bank nonperforming loans to total gross loans (%)



Note: The figure reports the share of total gross loans that are nonperforming (i.e. 90 days past due) for Greece, Italy, Portugal, and Spain. Data is provided by the World Bank and is compiled from the International Monetary Fund's Global Stability Reports. Diagram by IWH.

Figure 2

Distribution of current versus simulated capital ratios and NPL shares



Note: The figure reports the current and simulated NPL shares and Tier 1 ratios of a sample of German banks across different business cycle scenarios. The “V-shaped” scenario corresponds to the forecasts from Table 2.10 of the Spring 2020 Gemeinschaftsdiagnose. The “U-shaped” corresponds to the same values if the third and fourth quarter recoveries are half that estimated by the Gemeinschaftsdiagnose. The “L-shaped” scenario corresponds to the same values if there were no recovery in the third and fourth quarter. Sample of banks are from the 2019 vintage of Bankfocus and contains 1,068 banks for which we are able to identify a lending relationship and with coverage of Tier 1 capital, risk weighted assets, and nonperforming loans. Sample of firms from the 2019 vintage of Amadeus and contains 547,124 German firms for which we were able to identify a lending relationship. Diagram by IWH.

Tables

Table 1

Annual forecasted change in GDP over 2020

sector	annual change in GDP		
	V-shaped	U-shaped	L-shaped
manufacturing	-9.3%	-11.2%	-18.3%
energy, water supply, etc.	-1.5%	-5.3%	-11.8%
construction	1.7%	0.0%	-2.3%
retail, transport, and hospitality	-9.9%	-14.1%	-19.4%
information and communications technology	0.3%	-0.8%	-3.1%
finance and insurance services	1.1%	0.7%	0.5%
real estate activities	1.4%	1.0%	0.8%
business services	-6.9%	-11	-22.5%
public services	2.5%	2%	-0.6%
other services	-12.4%	-18.7%	-28.2%

Note: The table displays forecasted change in GDP over the year 2020 of each available sector for three different scenarios. The “V-shaped” scenario corresponds to the forecasts from Table 2.10 of the Spring 2020 Gemeinschaftsdiagnose. The “U-shaped” corresponds to the same values if the third and fourth quarter recoveries are half that estimated by the Gemeinschaftsdiagnose. The “L-shaped” scenario corresponds to the same values if there were no recovery in the third and fourth quarter.

Table 2

Assets, capital, and NPL shares

	assets (million EUR)		T		NPL share		n
	mean	SD	mean	SD	mean	SD	
commercial	117,115.8	243,296.3	0.16	0.05	0.03	0.04	15
head institutions	121,190.0	95,555.17	0.16	0.01	0.03	0.02	5
cooperative	899.0	2,544.4	0.16	0.04	0.02	0.02	705
savings	2,720.4	3,031.1	0.17	0.04	0.02	0.01	343

Note: Sample of banks are from the 2019 vintage of Bankfocus and contains 1,068 banks for which we are able to identify a lending relationship and with coverage of Tier 1 capital, risk weighted assets, and nonperforming loans. Sample of firms from the 2019 vintage of Amadeus and contains 547,124 German firms for which we were able to identify a lending relationship. Head Institutions are Landesbanken of the savings bank sector and the central head institution of the cooperative banking sector.

Table 3

Simulated Tier 1 ratios and NPL shares across business cycle scenarios

		V-shaped		U-shaped		L-shaped	
		Tier 1 ratio	NPL share	Tier 1 ratio	NPL share	Tier 1 ratio	NPL share
commercial banks	mean	0.10	0.05	0.09	0.06	0.07	0.09
	SD	0.05	0.05	0.05	0.06	0.05	0.06
cooperative banks	mean	0.12	0.04	0.11	0.05	0.09	0.07
	SD	0.05	0.02	0.05	0.02	0.05	0.03
head institutions	mean	0.12	0.04	0.12	0.05	0.11	0.06
	SD	0.05	0.02	0.05	0.02	0.07	0.03
savings banks	mean	0.13	0.04	0.12	0.05	0.09	0.07
	SD	0.05	0.02	0.05	0.02	0.06	0.02

Note: The table reports simulated Tier 1 ratios and NPL shares across three business cycle scenarios. The “V-shaped” scenario corresponds to the forecasts from Table 2.10 of the Spring 2020 Gemeinschaftsdiagnose. The “U-shaped” corresponds to the same values if the third and fourth quarter recoveries are half that estimated by the Gemeinschaftsdiagnose. The “L-shaped” scenario corresponds to the same values if there were no recovery in the third and fourth quarter. Sample of banks are from the 2019 vintage of Bankfocus and contains 1,068 banks for which we are able to identify a lending relationship and with coverage of Tier 1 capital, risk weighted assets, and nonperforming loans. Sample of firms from the 2019 vintage of Amadeus and contains 547,124 German firms for which we were able to identify a lending relationship.

Table 4

Share of banks in distress and of loans held by distressed banks

	V-shaped		U-shaped		L-shaped	
	share of banks distressed	share loans held by distressed banks	share of banks distressed	share loans held by distressed banks	share of banks distressed	share loans held by distressed banks
commercial banks	13.3%	0.3%	26.7%	0.7%	46.7%	17.2%
cooperative banks	6.5%	14.5%	12.1%	20.0%	28.4%	40.3%
head institution	20.0%	32.5%	20.0%	32.5%	20.0%	32.5%
savings banks	4.7%	4.6%	10.5%	11.1%	29.2%	39.0%
total	6.1%	7.1%	11.8%	10.2%	28.8%	29.3%

Note: The table reports the share of banks with simulated Tier 1 capital ratios under 6% and the share of loans held by banks with simulated Tier 1 capital ratios under 6% across different growth scenarios in the real economy. The “V-shaped” scenario corresponds to the forecasts from Table 2.10 of the Spring 2020 Gemeinschaftsdiagnose. The “U-shaped” corresponds to the same values if the third and fourth quarter recoveries are half that estimated by the Gemeinschaftsdiagnose. The “L-shaped” scenario corresponds to the same values if there were no recovery in the third and fourth quarter. Sample of banks are from the 2019 vintage of Bankfocus and contains 1,068 banks for which we are able to identify a lending relationship and with coverage of Tier 1 capital, risk weighted assets, and nonperforming loans. Sample of firms from the 2019 vintage of Amadeus and contains 547,124 German firms for which we were able to identify a lending relationship.

References

Bartik, A. W.; Bertrand, M.; Cullen, Z. B.; Glaeser, E. L.; Luca, M.; Stanton, C. T.: How are Small Businesses Adjusting to Covid-19? Early Evidence from a Survey (No. w26989). National Bureau of Economic Research, 2020.

Caballero, R. J.; Hoshi, T.; Kashyap, A. K.: Zombie Lending and Depressed Restructuring in Japan, in: *American Economic Review*, 98 (5), 2008, 1943-77.

De Jonghe, O.; Dewachter, H.; Mulier, K.; Ongena, S.; Schepens, G.: Some Borrowers are More Equal than Others: Bank Funding Shocks and Credit Reallocation, in: *Review of Finance*, Vol. 24 (1), 2020, 1-43.

Gropp, R. E.; Koetter, M.; McShane, W.: Transmitting Fiscal Covid-19 Counterstrikes Effectively: Mind the Banks! IWH Online 2/2020. IWH Online 2/2020. Halle (Saale) 2020.

Gropp, R. E.; Ongena, S.; Rocholl, J.; Saadi, V.: The Cleansing Effect of Banking Crises. Mimeo, 2020, Halle Institute for Economic Research (IWH).

McGowan, M. A.; Andrews, D.; Millot, V.: The Walking Dead?: Zombie Firms and Productivity Performance in OECD countries. OECD Working Papers, Vol. No. 1372, 2017.

Nkusu, M. M.: Nonperforming Loans and Macrofinancial Vulnerabilities in Advanced Economies (No. 11-161). International Monetary Fund, 2011.

Paravisini, D.; Rappoport, V.; Schnabl, P.: Specialization in Bank Lending: Evidence from Exporting Firms (No. w21800). National Bureau of Economic Research, 2015.

Peek, J. Rosengren, E. S.: Unnatural Selection: Perverse Incentives and the Misallocation of Credit in Japan, in: *American Economic Review*, 95 (4), 2005, 1144-1166.

Saidi, F.; Streit, D.: Bank Concentration and Product Market Competition. Paper presented at The 79th Annual Meeting of American Finance Association. AFA 2019, Atlanta, United States.

Steinkamp, S.; Tornell, A.; Westermann, F.: Evergreening in the Euro Area: Facts and Explanation. Working Paper, 2018.



Halle Institute for Economic Research (IWH) -
Member of the Leibniz Association

Kleine Maerkerstrasse 8
D-06108 Halle (Saale)
Germany

P.O. Box 11 03 61
D-06017 Halle (Saale)
Germany

Tel +49 345 7753 60
Fax +49 345 7753 820

www.iwh-halle.de

ISSN 2195-7169