

# Non-performing Loans – Different this Time?

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NPL resolution after COVID-19: Main  
differences to previous crises



External author:  
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## NPL resolution after COVID-19: Main differences to previous crises

### **Abstract**

Model estimates of NPLs of a large sample of banks in the euro area suggest that macro-economic factors drive NPLs. This implies that the NPL-ratio may not increase in a similar fashion as after the global financial crisis. However, the low fit of the model shows that idiosyncratic factors play a major role in explaining NPLs. This is illustrated in a case study for the Netherlands which suggests that deferred tax payments may lead to increasing NPLs.

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## **CONTENTS**

<b>LIST OF ABBREVIATIONS</b>	<b>6</b>
<b>LIST OF FIGURES</b>	<b>7</b>
<b>LIST OF TABLES</b>	<b>7</b>
<b>EXECUTIVE SUMMARY</b>	<b>8</b>
<b>1. INTRODUCTION</b>	<b>9</b>
<b>2. WHAT DRIVES NPLS?</b>	<b>11</b>
<b>3. MODEL AND RESULTS</b>	<b>13</b>
<b>4. A CASE STUDY FOR THE NETHERLANDS</b>	<b>16</b>
<b>5. CONCLUSIONS</b>	<b>18</b>
<b>REFERENCES</b>	<b>20</b>
<b>ANNEX</b>	<b>22</b>

## LIST OF ABBREVIATIONS

<b>EBA</b>	European Banking Authority
<b>ECB</b>	European Central Bank
<b>EU</b>	European Union
<b>CET1</b>	Common Equity Tier 1
<b>GDP</b>	Gross Domestic Product
<b>GFC</b>	Global financial crisis
<b>LTA</b>	Loans to Assets
<b>LTD</b>	Deposits to Loans
<b>NPL</b>	Non-performing loan
<b>ROA</b>	Return on Assets
<b>ROE</b>	Return on Equity
<b>SMEs</b>	Small and medium-sized enterprises

## LIST OF FIGURES

Figure 1: NPL ratios in major countries and regions, 2014-2020 (in %)	11
Figure 2: Volume of loans to firms with public guarantee (EUR billion)	16
Figure 3: Volume of loans under EBA-compliant moratoria (EUR billion)	17
Figure 4: Expected performance of loans with moratoria (%), September 2020	18

## LIST OF TABLES

Table 1: Baseline model in which only macroeconomic drivers are included	14
Table 2: Adding bank-specific control variables to the baseline model	15
Table 3: Deferred taxes on 18 January 2021 (EUR million)	17

## EXECUTIVE SUMMARY

### Background

The NPL-ratio (the ratio of non-performing loans and total loans) in the EU stood in June 2020 at 2.9%, while total NPLs stood at EUR 528 billion, 10% less than 1 year earlier. Still, the NPL ratio in the euro area is higher than the NPL ratio in other advanced countries.

The COVID-19 pandemic and the accompanying lockdown measures are often argued to lead to an increase of the NPL ratio in the coming years. Previous research suggests that pre-crisis NPLs are not a good indicator of future NPL problems and that macro and banking conditions help predict future NPL problems.

### Aim

The purpose of this analysis is to provide new insights about the drivers of NPLs, which can be used to develop scenarios for the development of the NPL ratio. The analysis presents econometric estimates for the NPL ratio in the euro area, which will allow us to examine to what extent NPLs will increase in a similar fashion as after the GFC. For that purpose, the position paper proposes an empirical model for NPLs for a very large sample of banks in countries in the euro area over the period 1995-2019.

Three conclusions follow from the analysis. First, macro-economic factors (GDP growth and the unemployment rate), which obviously are outside the control of banks, are important and robust drivers of the NPL-ratio. According to the most recent forecasts of the European Commission, GDP growth in 2021 in the EU (euro area) will amount to 3.7% (3.8%). The unemployment rate stabilised in December at 7.5% in the EU (8.3% in the euro area). From this perspective, the econometric results presented in this position paper suggest that the NPL ratio may not increase to levels seen after the global financial crisis.

Second, adding to this optimism is that some bank-specific factors that have been found to be related to banks' NPL ratios, notably banks' capital ratios, are in a much better shape than after the financial crisis. So, if the economic recovery proceeds as forecasted, NPLs may not become as problematic as after the financial crisis.

Third, and suggesting less optimism, the full model only explains a small part of the variation of NPLs of the banks in euro area countries. This suggests that other factors play a role. One such factor is efficient legal enforcement. Recent research suggests that the combination of weak bank balance sheets and inefficient legal enforcement leads borrowers to delay debt repayment. This implies that improving banks' ex post ability to enforce contracts (in court) improves borrowers' ex ante incentives to repay.

Other country-specific factors may also play a role and that is why the position paper offers a case study of NPLs of banks in the Netherlands. This analysis suggests that government guarantees will only shield a very small portion of bank loans. Furthermore, tax deferrals, one of the policy measures that the government took to combat the economic consequences of the pandemic, may, eventually, affect NPLs. In January 2021, tax deferrals in the Netherlands amounted to almost EUR 13 billion. Extending the period over which tax deferrals and refunds are possible as well as more customized solutions by sector are crucial additional government measures to reduce bankruptcies (which will result in increasing NPLs). Finally, Dutch banks have issued payment deferrals (also known as moratoria), which temporarily allow customers not to pay interest and/or repayments on their loan. Banks expect for 29% of the customers' higher credit losses in the future. This, again, suggests that even if the recovery proceeds as forecasted by the Commission, the NPL ratio may still rise.



## 1. INTRODUCTION

A non-performing loan (NPL) is a loan that is in arrears at least 90 days or that is being close to default.<sup>1</sup> Generally, NPLs are scaled by total loans on banks' balance sheets (NPL-ratio).

High and unresolved NPLs are associated with deeper recessions and slower recoveries (Ari et al., 2020a, b). Banks play a key role herein. As pointed out by Huljak et al. (2020), high NPL ratios may adversely affect the soundness of the banking system and its ability to lend to the real economy. First, high NPL ratios reduce bank profits as they require higher provisions, reduce interest income, generate higher monitoring expenses and lead to an increase in funding costs due to banks' higher credit risk. Second, non-performing loans have higher risk weights, thereby increasing capital requirements which may cause banks to reduce leverage, leading to a contraction in credit supply. Indeed, the empirical findings of Huljak et al. (2020) for 12 euro-area countries suggest that an exogenous increase in the change in NPL ratios tends to depress bank lending (notably bank lending to non-financial corporations), widens lending spreads and leads to a fall in real GDP growth and residential real estate prices.

Persistently high NPL ratios were a concern in several European countries after the 2008-2012 crisis. The NPL ratio in the euro area peaked around 8% in 2014. The economic recovery in the second half of the decade helped to reduce the euro area NPL ratio. According to the EBA (2020b), the NPL-ratio in the EU stood in June 2020 at 2.9%, i.e., around 50 bps lower than in June 2019 and 20 bps lower than in December 2019. In June 2020, total NPLs stood at EUR 528 billion, 10% less than 1 year earlier (EUR 581 billion). In June 2020, NPLs of non-financial firms and household made up more than 95% of total NPLs and reached EUR 510 billion.

However, the stock of NPLs differs largely across countries. According to the EBA (2020b), France reported the highest volume of NPLs (EUR 127 billion) in June 2020, followed by Italy with EUR 108 billion (EUR 29 billion less than in June 2019). Greece (30.3%) and Cyprus (15.5%) reported the highest NPL ratios.

The COVID-19 pandemic and the accompanying lockdown measures are often argued to lead to an increase of the NPL ratio in the coming years. As pointed out by the European Commission (2020), banks are exposed to companies and individuals that have become financially more vulnerable, notably small and medium-sized enterprises (SMEs), and specific industries (like transport, tourism and hospitality).

Ari et al. (2020a) analyse the evolution of NPLs during 88 banking crises in 78 countries since 1990. Two important conclusions follow from their analysis. First: *pre-crisis NPLs are not a good indicator of future NPL problems*. NPL ratios typically follow an inverse U-shaped pattern during crises, i.e., they start at modest levels, rise rapidly around the start of the crisis, and peak some years afterwards, before stabilizing and declining. Second: *macro and banking conditions help predict future NPL problems*.

The purpose of this analysis is to provide new insights about the drivers of NPLs, which can be used to develop scenarios for the development of the NPL ratio. The analysis presents econometric estimates for the NPL ratio in the euro area. The analysis will yield with some ballpark estimates for key elasticities, like those of real growth and unemployment. This will allow us to examine to what extent NPLs will increase in a similar fashion as after the GFC.

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<sup>1</sup> The EBA (2019) defines NPLs as follows: Non-performing loans satisfy either of the following criteria: (a) material exposures that are more than 90 days past due; and (b) the debtor is assessed as unlikely to pay its credit obligations in full without realisation of collateral, regardless of the existence of any past due amount or of the number of days past due.

It is important to get a better quantitative insight in the drivers of the NPL ratio as it is highly uncertain to what level this ratio will rise. As pointed out by Ari et al. (2020a, b), unlike the global financial crisis (GFC), the economic downturn due to the COVID-19 pandemic is not a credit boom-induced crisis. If the pandemic-induced downturn proves temporary, many post-COVID-19 NPLs may relate to viable illiquid firms, rather than unviable zombie firms. In addition, already before the COVID-19 pandemic, central banks had reduced real interest rates to very low levels. This is important, as some previous studies (and also the present analysis) suggest that high real interest rates increase NPLs.

Furthermore, European banks' current possibilities to withstand a crisis are much better compared to the 2008 crisis.<sup>2</sup> According to the EBA (2020a), EU banks have, for instance, higher capital. Banks now hold larger capital buffers, compared to the GFC in 2008-2009. For instance, the Common Equity Tier 1 (CET1) ratio has increased from 9% in 2009 to approximately 15% in Q4 2019, which is well above the regulatory requirements. This improved capital position may not only be very helpful in dealing with higher NPLs, but some previous studies (and also the present analysis) suggest that banks' equity ratio also has a negative relationship with NPLs which implies that NPLs may not increase as much as during the GFC.

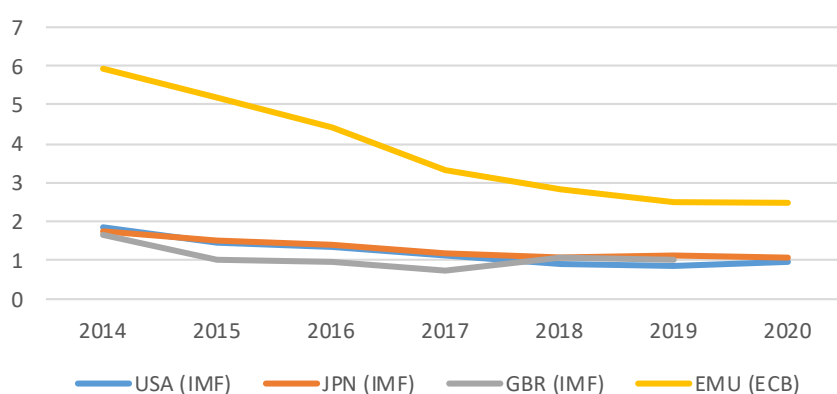
Finally, governments have introduced a wide array of supportive measures which took the form of tax deferrals and direct grants to compensate for lost turnover, and temporary employment benefits to allow businesses to keep their employees. Governments also devised loan guarantee schemes, allowing firms with liquidity needs to borrow more easily from banks. Loan payment holidays were also implemented in many countries which were supplemented by regulatory measures to prevent banks from having to massively mark loans as problematic. In addition, the European Central Bank (ECB) made sure there was ample liquidity in the financial system (ING, 2020). As a result of all these measures, the number of defaults in many countries actually dropped in 2020.

However, other factors point in a different direction. For instance, compared to 2008, most European countries have substantially higher public debt. Even countries which entered the pandemic crisis with decreasing debt-to-GDP ratios saw their indebtedness rise very fast due to supportive government measures taken and weaker cyclical conditions. This may constrain government policies during the recovery from the pandemic crisis. If the economic recovery from the pandemic is slow and protracted, credit losses from corporate distress will rise and could overwhelm banks, further complicating NPL resolution (Ari et al., 2020a, b). In addition, in recent years the profitability levels of banks were low. Low interest rates, which put further pressure on bank profits, are expected to continue for a longer period of time. Finally, despite the improvement since the GFC, the euro area is still much more exposed to NPLs than other regions (cf. Figure 1).

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<sup>2</sup> This reflects both more stringent microprudential requirements, while macroprudential policies may also have played a role. Since the GFC, macroprudential policies have gained importance. In contrast to microprudential policies, which aim at the soundness of individual financial institutions, macro-prudential policies aim at the financial system as a whole. Galati and Moessner (2018) provide an overview of studies examining the effectiveness of macroprudential policies. There is substantial evidence that borrower-targeted macroprudential policies have some effects on house price growth and housing credit growth. By contrast, empirical evidence on the effects of financial-institutions-based macroprudential policies is less conclusive and more mixed.

Figure 1: NPL ratios in major countries and regions, 2014-2020 (in %)



Source: IMF and ECB.

This position paper proposes an empirical model for NPLs for a very large sample of banks in countries in the euro area over the period 1995-2019.

The position paper is structured as follows. The next section discusses what we can learn from previous studies on NPLs and comes up with our proposed model, while section 3 presents our estimation results for the NPL ratio of banks in euro area countries. Section 4 offers a case study for the Netherlands to illustrate how several COVID-19 related measures introduced by authorities and loan moratoria by banks have affected the loan portfolio of Dutch banks. This discussion complements our model estimates, which cannot take such specific factors into account.

## 2. WHAT DRIVES NPLS?

Surprisingly, there are only a few studies examining the drivers of NPLs in euro area countries.<sup>3</sup> Appendix A summarises relevant studies.<sup>4</sup> Several studies rely on national data, whereas others employ bank-level data (Salas and Saurina, 2002; Jiménez and Saurina 2006; Louzis et al., 2012; Anastasiou et al., 2016; 2019 and Karadimi and Louri, 2020), which has the advantage that bank-specific factors can be taken into account. Anastasiou et al. (2016; 2019), Peric and Konjusak (2017) and Cerulli et al. (2020) include banks in several countries, like the present study, while others (Salas and Saurina, 2002, Jiménez and Saurina 2006; Louzis et al., 2012) focus on banks in one country (Spain and Greece, respectively). Compared to other studies, the number of banks included in our analysis is much larger.

As shown in Appendix A, the literature has identified the level of economic activity and interest rates as the most relevant macro-economic drivers of NPLs. Improved economic conditions, i.e. higher economic growth and lower unemployment, and lower (real) interest rates are found to strengthen the repayment capacity of borrowers thereby lowering NPL ratios.<sup>5</sup> These variables are included in our

<sup>3</sup> Manz (2019) presents a systematic literature review of 44 studies on determinants of non-performing loans published for the period 1987 to 2017 in 30 peer-reviewed journals. Our selection of variables included in the model is very much based on his analysis.

<sup>4</sup> Other papers focus on different sets of countries. For instance, Ghosh (2017) analyses NPLs of US banks from 1992 to 2016. His results suggest that economic conditions in US states as well as increases in state housing price indices lower NPLs. His findings also suggest that a higher loans-to-assets ratio positively influences NPLs. Beck et al. (2016) examine NPLs at the country level for 75 countries during the past decade. The following variables are found to significantly affect NPL ratios: real GDP growth, share prices, the exchange rate, and the lending interest rate.

<sup>5</sup> GDP growth and unemployment have been identified as primary determinants of NPLs in the theoretical literature of life-cycle consumption models. For example, Rinaldi and Sanchis Arellano (2006) formulate a model in which lower income and unemployment leads to higher default rates due to decreased cash inflows for the borrower.

model for NPLs of banks located in euro area countries. Interestingly, some studies (Louzis et al., 2012; Makri et al., 2014; Konstantakis et al., 2016) report that government debt is also related to NPLs. Louzis et al. (2012) argue that sovereign debt distress places a 'ceiling' on the creditworthiness of national banks. Moreover, higher public debt may lead to fiscal consolidation which puts pressure on households' income and aggregate demand (Ghosh, 2015). In view of the increasing sovereign debt ratios due to the COVID-19 pandemic, we have tested whether government debt is positively related to the NPL-ratio in our sample (it is not).

Following Louzis et al. (2012), we first estimate a baseline model, which includes only macroeconomic indicators and then add bank-specific variables to the model. A wide array of bank-specific variables has been considered in previous studies (see Appendix A). We have decided to focus on a few bank-specific variables for two reasons. First, for some frequently used variables causality is likely to run from NPLs to these variables; this holds, for instance, for bank profitability (often proxied by Return on Assets (ROA) or Return on Equity (ROE)). Elekdag et al. (2020) find that apart from economic growth, the NPL ratio is the most reliable determinant of bank profitability in the euro area. Second, the literature provides very mixed support for several other bank-specific variables. Our selection of bank-specific variables is based on the support previous studies report for their inclusion.

The first variable included is loan growth. A bank trying to increase its market share is likely to reduce its minimum credit standard, which increases the chances of loan defaults by borrowers (Ghosh, 2015). Furthermore, this bank will be negatively affected by adverse selection, as other banks will try to keep their best customers and will let their lowest-quality customers go to another bank (Salas and Saurina, 2002). We measure loan growth by the loans-to-assets ratio, similar to some previous studies (Ghosh, 2015; Klein, 2013). Here it is important to take sufficient lags into account. For instance, Jiménez and Saurina (2006) report a robust relationship between rapid credit growth and problem loans later on, but only with a lag of around four years. Cerulli et al. (2020) also report that lagged credit growth leads to higher NPLs.

The next variable considered is bank capitalisation. As pointed out by Ghosh (2015), managers in banks with low capital bases face a moral hazard incentive to engage in high-profitability but high-risk lending, which implies an inverse relationship between equity capital and NPLs. There is some support for a negative relationship between the capital and NPLs ratios (Salas and Saurina, 2002; Klein, 2013; Makri et al., 2014). We measure capitalization by the ratio of total equity capital to total assets, following several previous studies.

Finally, we include the loan-to-deposits (LTD) ratio. According to Anastasiou et al. (2019: 100), "LTD is expected to be positively associated with NPLs, because a higher ratio of loans with respect to deposits means easier loan granting; a risk-loving attitude; and, therefore, a higher probability of developing NPLs." We measure LTD as banks' deposits to total liabilities.

Appendix B summarises the data used in the present analysis.

### 3. MODEL AND RESULTS

We employ data from Fitch for banks located in the euro area at the consolidated level for the period 1995-2019. All banks for which Fitch provides sufficient data have been included in our analysis. Based on the discussion in the previous section, the model considered is as follows:

$$DNPL_{j,i,t} = F(GDP_{i,t}, U_{i,t}, real\ interest_{i,t}, LTA_{j,i,t}, Equity_{j,i,t}, LTD_{j,i,t}) \quad (1)$$

The left-hand side variable ( $DNPL_{j,i,t}$ ) is the change in the NPL ratio of bank  $j$  in country  $i$  in year  $t$ .<sup>6</sup> Where  $GDP_{i,t}$  refers to the growth rate of real GDP,  $U_{i,t}$  is the unemployment rate, and  $real\ interest_{i,t}$  is the real 3-month rate (minus actual CPI inflation) in country  $i$  in year  $t$ , following Claessens et al. (2018). We also included government debt as some previous studies suggest that higher sovereign debt leads to a higher NPL ratio. However, we found no support for this claim. These are the macroeconomic drivers of NPLs. In the second stage, we add a few bank-specific controls, namely:  $LTA_{j,i,t}$  i.e. the loan-to-assets ratio,  $Equity_{j,i,t}$  which is the ratio of equity to total assets and  $LTD_{j,i,t}$  which is the deposits-to-total-liabilities ratio.

Table 1 shows the estimation results for the baseline model in which only macroeconomic variables are included; the model is estimated using bank FE. We start with a simple model in which  $GDP$  and a crisis dummy (*crisis*) are included. This dummy is one after 2009, and zero before. It captures whether the change in the NPL-ratio is different after the GFC, as previous studies (cf. Ari et al., 2020a) would suggest. Subsequently, we add unemployment and the real interest rate, after which we include all macroeconomic variables. The results suggest that a higher GDP growth reduces banks' NPL ratios. The effect is both statistically and economically significant. A one percent higher growth rate reduces the NPL ratio by 0.25. The unemployment rate also has a strong relationship with NPLs. A percent increase of the unemployment rate is associated with an increase of 0.06 of the NPL ratio. Somewhat surprisingly, we do not find strong evidence that the real interest rate has a significant impact on NPLs. Although its coefficient is weakly significant in column (3), in column (4) it is not significantly different from zero.

Our evidence suggests that macro-economic factors, which obviously are outside the control of banks, are important drivers of the NPL-ratio. This finding is in line with the results of previous studies. Another important conclusion that follows from our analysis is that despite their importance, macro-economic factors only explain a small fraction of banks' NPLs. As can be seen in Table 1, indicated by the R squared values, our baseline model with only macroeconomic drivers explains - depending on which variables are included - between 5% and 7% of the observed variation, which leaves ample room for other explanatory variables. Next, we check whether the explanatory power of the model increases if bank-specific factors are added to the baseline model.

<sup>6</sup> Several previous studies report that the lag of the NPL ratio is significant in a regression in which the level of the NPL ratio is used. We therefore decided to use the change in the NPL ratio as dependent variable.

Table 1: Baseline model in which only macroeconomic drivers are included

	(1)	(2)	(3)	(4)
GDP	-0.253*** (-14.28)	-0.252*** (-14.34)	-0.246*** (-14.42)	-0.250*** (-14.58)
crisis	0.706*** (9.15)	0.598*** (7.46)	0.815*** (8.53)	0.637*** (6.06)
U		.063*** (4.65)		.060*** (4.17)
real interest			0.038* (1.99)	0.012 (0.57)
constant	-0.175** (-2.60)	-0.611*** (-5.33)	-0.255*** (-3.33)	-0.616*** (-5.36)
N	18,791	18,791	18,791	18,791
R2 within	0.0524	0.0542	0.0527	0.0542
R2 between	0.0539	0.1032	0.0589	0.1036
R2 overall	0.0533	0.0675	0.0542	0.0674

Notes: Estimates of eq. (1) without bank-specific controls. The model included bank fixed effects. T-statistics are shown in parentheses. \*, \*\*, \*\*\* indicate significance at the 5, 1 and 0.1 percent, respectively.

Table 2 shows the estimation results when we add bank-specific controls. As in Table 1, we first add them sequentially and then simultaneously. In column (1), we add the LTA ratio and two lags. The results suggest that a higher LTA ratio increases the NPL ratio but not immediately. This finding is broadly in line with the results of previous studies. In column (2) we add the equity ratio. The results suggest that a higher equity ratio reduces the NPL ratio, but the effect is not very strong. Finally, our results do not suggest that the LTD ratio is related to NPLs. Overall, these results indicate that whereas banks' lending affects their NPL-ratio, banks' funding is less relevant.

Adding bank-specific controls increases the fit of our model. Still, the full model only explains a small part of the variation of NPLs of the banks in euro area countries. This suggests that other factors play a role. One such factor is efficient legal enforcement. From a theoretical perspective, a borrower has a strategic incentive for a delay in loan repayment. A firm will be trading off the short-term gain of not paying now against the potential future loss of impairing its relationships with its current lender(s) or potential future lender(s). As Schiantarelli et al. (2020) point out, which side of this trade-off dominates may depend, inter alia, on the lender's financial health and the institutional environment (which affects banks' ex post ability to recover collateral or otherwise force re-payment through the judicial process). Using data from the Italian Credit Register, Schiantarelli et al. (2020) examine the role institutional quality using the fact that even though civil law and procedures are formally the same across Italy, the real-world effectiveness of the court system varies widely across local jurisdictions. Their results suggest that the combination of weak bank balance sheets and inefficient legal enforcement leads borrowers to delay debt repayment. Borrowers selectively delay payment to banks already weakened by past bad loans while continuing to pay healthier banks. Ineffective legal enforcement exacerbates this problem. Likewise, Cerulli et al. (2020) report in their study on NPLs of large banks in 21 European countries support for what they call the 'judicial inefficiency hypothesis': a higher number of days required to

enforce contracts increases the NPL ratio. These studies imply that improving banks' ex post ability to enforce contracts (in court) improves borrowers' ex ante incentives to repay.

Apart from legal enforcement, other (country-specific) factors may impact NPLs. This is illustrated in the following case study on the Netherlands.

Table 2: Adding bank-specific control variables to the baseline model

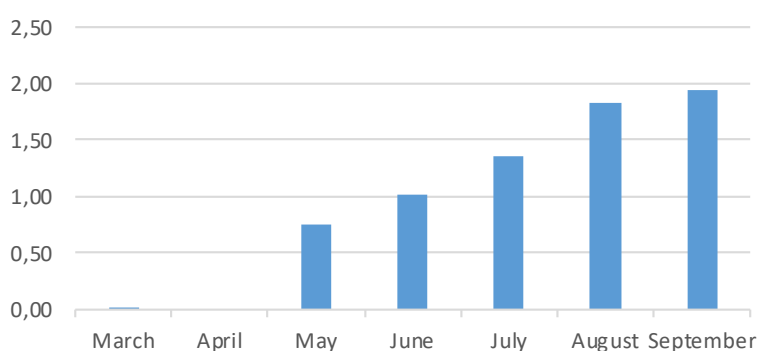
	(1)	(2)	(3)	(4)
GDP	-0.187*** (-8.82)	-0.248*** (-14.56)	-0.238*** (-13.36)	-0.177*** (-8.07)
crisis	0.264* (2.08)	0.611*** (5.77)	0.698*** (6.61)	0.262* (2.04)
U	0.133*** (6.29)	0.056*** (4.16)	0.081*** (4.75)	0.136*** (6.16)
real interest	0.059* (2.14)	0.011 (0.55)	0.017 (0.83)	0.060* (2.18)
LTA	-0.049** (-3.19)			-0.053** (-3.06)
LTA(-1)	0.077*** (3.91)			0.082*** (4.07)
LTA (-2)	0.028*** (3.11)			0.026*** (3.09)
Equity		0.019 (0.59)		0.055 (1.33)
Equity (-1)		-0.054* (2.02)		-0.094** (-2.97)
LTD			-0.013** (-2.58)	-0.067 (-1.11)
constant	-4.307*** (-9.55)	-0.227 (-0.95)	0.266 (0.74)	-3.56*** (-4.45)
N	14,602	18,791	18,791	14,602
R2 within	0.0906	0.0556	0.0558	0.0944
R2 between	0.1100	0.0587	0.1152	0.1166
R2 overall	0.0756	0.0631	0.0751	0.0788

Notes: Estimates of eq. (1) with bank-specific controls. The model included bank fixed effects. T-statistics are shown in parentheses. \*, \*\*, \*\*\* indicate significance at the 5, 1 and 0.1 percent, respectively.

## 4. A CASE STUDY FOR THE NETHERLANDS<sup>7</sup>

In September 2019, Dutch banks had almost EUR 1,900 billion in loans outstanding. As pointed out in the introduction, most governments have taken measures in response to the COVID-19 pandemic to support the economy. This is also the case in the Netherlands. These measures have impact on loans on banks' balance sheets. For example, the Dutch government has set up guarantee schemes that reduce banks' risk on new loans provided. Figure 2 shows the volume of loans to firms with a government guarantee. The figure illustrates that loans covered by government guarantees will shield only a very small proportion of banks' total loans (approximately 0.1% thereof).

Figure 2: Volume of loans to firms with public guarantee (EUR billion)



Source: DNB.

Tax deferrals is another policy measure that the government took which may, eventually, affect NPLs. By deferring taxes, firms received liquidity support which may help them survive the pandemic-induced recession. According to a panel of restructuring experts, the repayment obligation of this tax debt will become the main reason for inflow into restructuring and recovery (PWC, 2021). Hospitality, wholesale and retail trade, culture and recreation are the sectors where the expected influx to special management is highest. Banks will, in that case, be confronted with a sharp increase in NPLs. The amounts involved are large, as shown in Table 3. In January 2021, tax deferrals amounted to almost EUR 13 billion. The table also shows that there are large differences across sectors. Notably sectors like trade and transport have substantial amounts of deferred taxes. It is noteworthy that also large firms have large tax deferrals. Their bankruptcy may lead to a fast rise in the unemployment rate, reversing the current trend of a declining unemployment rate. Extending the period over which tax deferrals and refunds are possible as well as more customized solutions by sector are crucial additional government measures to reduce bankruptcies, which will otherwise lead to higher NPLs.

<sup>7</sup> This section draws on DNB (2020) and PWC (2021).



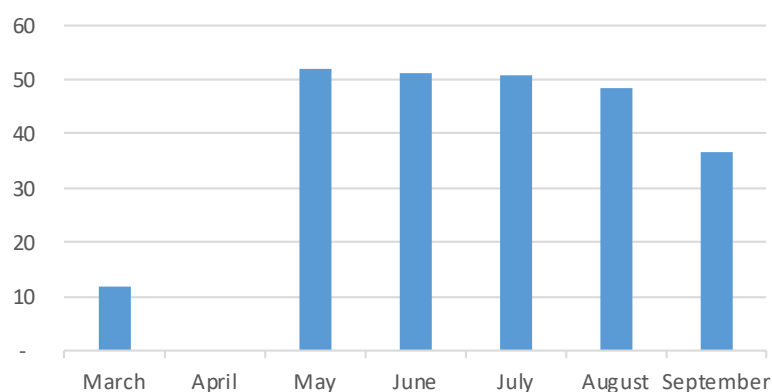
Table 3: Deferred taxes on 18 January 2021 (EUR million)

	Number of employees:					
	1	max 9	10-49	50-249	250+	
<b>Total</b>	12 601	1 822	1 813	2 574	2 419	3 973
of which:	1 691	78	116	374	613	510
Construction	946	309	124	158	109	246
Trade	2 398	265	482	586	484	581
Transport	1 655	62	77	149	167	1 200
Hospitality	797	46	205	271	150	124
Specialist services	1 270	379	247	292	214	138
Rental and other business services	1 276	96	124	217	296	543

Source: Statistics Netherlands.

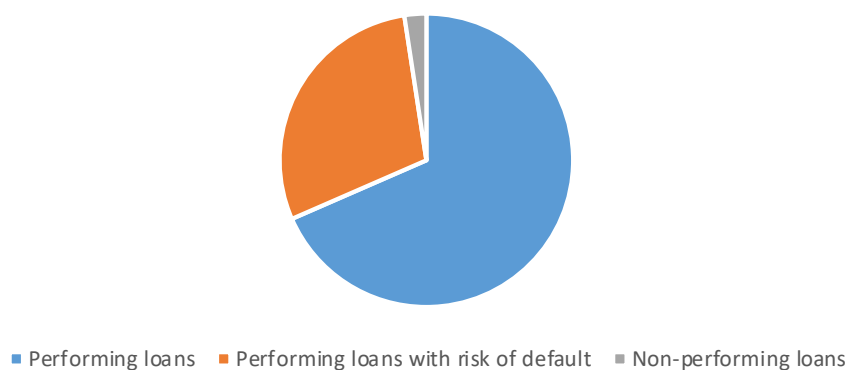
Banks have also issued payment deferrals (also known as moratoria), which temporarily allow customers not to pay interest and/or repayments on their loan. In that sense, they are similar to tax deferrals, which also do not affect the obligation to pay but provides lenders the possibility to pay at a later stage. This gives customers time to deal with the effects of the lockdown on their businesses, without risking being registered as defaulters. As shown in Figure 3, such moratoria apply to quite a substantial amount of loans. However, banks expect that a large proportion of these customers, some 69%, will be able to repay their loans, while less than 2% will not (see Figure 4). For 29% of customers with moratoria there are no payment problems at the moment, but banks expect higher credit losses in the future. These numbers indicate that although currently NPLs on loans with a moratorium are small, they may substantially increase in view of expected credit losses in the future.

Figure 3: Volume of loans under EBA-compliant moratoria (EUR billion)



Source: DNB.

Figure 4: Expected performance of loans with moratoria (%), September 2020



Source: DNB.

## 5. CONCLUSIONS

High and persistent NPL ratios will hamper economic recovery as they adversely affect the soundness of the banking system and its ability to lend to the real economy. Higher NPL ratios tend to depress bank lending (notably bank lending to non-financial corporations), widens lending spreads and leads to a fall in real GDP growth. At the same time, the present analysis has shown that macro-economic factors, notably GDP growth and the unemployment rate, have a strong and robust impact on the NPL ratio of banks in the euro area. This finding is consistent with the results of previous research, which is mostly based on samples that are much smaller than used in this position paper. Furthermore, most previous research focuses on banks in one country, whereas the analysis presented in this position paper is based on banks in all euro area countries.

According to the most recent forecasts of the European Commission, GDP growth in 2021 in the EU (euro area) will amount to 3.7% (3.8%). The unemployment rate stabilised in December at 7.5% in the EU (8.3% in the euro area). From this perspective, the econometric results presented in this position paper suggest that the NPL ratio may not increase to levels seen after the global financial crisis. Adding to this optimism is that some bank-specific factors that have been found to be related to banks' NPL ratios, notably banks' capital ratios, are in a much better shape than after the financial crisis. So, if the economic recovery proceeds as forecasted, NPLs may not become as problematic as after the financial crisis. Still, previous research suggests that NPLs usually start at modest levels, rise rapidly around the start of the crisis, and peak some years afterwards. This should act as a warning against complacency.

Furthermore, the full model presented in this position paper only explains a small part of the variation of NPLs of the banks in euro area countries. This suggests that other factors play a role. And these factors may lead to higher NPLs. One such factor is efficient legal enforcement. Recent research suggests that the combination of weak bank balance sheets and inefficient legal enforcement leads borrowers to delay debt repayment. This implies that improving banks' ex post ability to enforce contracts (in court) improves borrowers' ex ante incentives to repay.

Other country-specific factors may also play a role and that is why the position paper offers a case study of NPLs of banks in the Netherlands. This analysis suggests that government guarantees will only shield a very small portion of bank loans. Furthermore, tax deferrals, one of the policy measures that the government took to combat the economic consequences of the pandemic, may, eventually, affect NPLs. In January 2021, tax deferrals in the Netherlands amounted to almost EUR 13 billion. Extending the period over which tax deferrals and refunds are possible as well as more customized solutions by

sector are crucial additional government measures to reduce bankruptcies (which will otherwise lead to higher NPLs). Finally, Dutch banks have issued payment deferrals (also known as moratoria), which temporarily allow customers not to pay interest and/or repayments on their loan. Banks expect that 29% of the customers with a moratorium may face higher credit losses in the future. This, again, suggests that even if the recovery proceeds as forecasted by the Commission, the NPL ratio may still rise.

Banks prepare for higher losses in the future by making provisions. It is possible that the crisis' maximum impact on banks' capital in the euro area will not be felt until 2022. Supervisors therefore need to monitor carefully whether banks timely recognise payment problems of their customers, notably on loans on which moratoria have been granted. The global financial crisis has shown that the slow recognition and handling of high numbers of loans with payment problems ultimately hinders economic recovery (DNB, 2020).

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## ANNEX

### Appendix A. Survey of selected studies on NPLs in EU countries

Study:	Countries (no. banks):	Period:	Macro-economic variables:	Bank-specific variables:
Salas and Saurina (2002)	Spain (commercial and saving banks)	1985-1997	GDP growth (-), household/firm debt (NS/ +,-)	Loan growth (NS/+), branch growth (+/NS), operating costs (NS/+), portfolio composition (NS/+), size (-/NS), interest margin (NS/-), capital ratio (-/NS), market power (NS/+)
Rinaldi and Sanchis-Arellano (2006)	7 euro-area countries (households at country level)	1989-2004	Household debt (+), household income (NS), household assets (NS), unemployment (+), inflation (+), real interest rate (+)	
Jimenez and Saurina (2006)	Spanish banks	1984-2002	GDP growth (-), real interest rate (+)	Lagged loan growth (+), loan concentration measures (+/NS), size (NS), specialization (NS)
Louzis et al. (2012)	Greece (9 largest banks)	2003-2009	Growth (-), unemployment (+), lending rate (+), government debt (+)	ROE (-), capital ratio (NS), operating expenses (+), size (NS), non-interest income (NS), leverage (+), ownership concentration (+)
Klein (2013)	16 countries (ten largest banks in each country)	1998-2011	D(Unemployment) (+), inflation (+), depreciation (+), VIX (+), D(euro area growth) (-)	Equity/assets (-), ROE (-), loans/assets (+), loan growth (+)
Makri et al. (2014)	14 euro-area countries (country level)	2000-2008	Government debt (+), deficit (NS), growth (-), inflation (NS), unemployment (+)	Capital ratio (-), LTD (NS), ROA (NS), ROE (-)
Konstantakis et al. (2016)	Greece, national level	2001-2015	GDP cycle (-), unemployment (+), government debt (+), bank credit (+)	
Anastasiou et al. (2016)	Banks in 15 euro-area countries (115-138)	1990-2015	Growth (-), inflation (NS), government debt (-), deficit (NS), unemployment (+), output gap (NS/-), income taxes (+/-), output gap (NS), interest rate (NS)	ROA (NS), ROE (-), LTD (+/-)
Peric and Konjusak (2017)	11 CEE countries (237 banks)	1999-2013	Growth (-), real interest rate (+), inflation (NS)	ROA (-), size (NS), credit growth (+)
Anastasiou et al. (2019)	Banks in 14 euro-area countries (226)	2003-2016	Growth (-), unemployment (+), income taxes (+), deficit (+), interest margin (+), inflation (NS), credit (-), crisis (+)	ROA (-), LTD (-), size (NS)
Cerulli et al. (2020)	124 large banks in 21 European countries	2006-2017	Growth (-), long-term interest rate (+), judicial inefficiency (+)	Capital ratio (NS), ROA (NS), credit growth (+)
Karadimi and Louri (2021)	4 euro-area countries (507)	2005-2017	Growth (-), inflation (-), policy uncertainty (+), bank concentration (+), crisis dummy (+)	Loans/assets (+), loan growth (NS), LTD (NS), size (NS), ROA (-)

+ means significant and positive; - means significant and negative; NS means not significant

**Appendix B. Data**

Table B1. Description of the data

Country	No. Groups	No. Observations
Austria	41	246
Belgium	16	101
Germany	1582	8575
Spain	78	668
Estonia	10	84
Finland	20	165
France	377	2879
Greece	17	101
Ireland	21	96
Italy	794	9216
Lithuania	13	123
Luxembourg	24	133
Latvia	27	228
The Netherlands	23	85
Portugal	131	865
Slovak Republic	21	219
Slovenia	20	219
N	3215	24003

Source: Fitch, author calculations.

Table B1 describes the panel. The first column gives the number of groups per country in the sample. The second column gives the number of observations per group based on the number of observations used in the final regressions (for which there is data).

Table B2 shows the descriptive statistics for non-performing loans. The first column is the number of observations per country. The remaining four columns are the mean, standard deviation, minimum and maximum respectively. The min and max at 0 and 40.02 are common as the data has been winsorized around these points.

Table B2. NPLs per country

Country	No. Obs	Mean	St.Dev	Min	Max
Austria	246	4.71	3.412	0	14.68
Belgium	101	4.06	5.69	0.23	34.46
Germany	8575	3.02	2.79	0	40.02
Spain	668	5.93	5.53	0	40.02
Estonia	84	5	7.14	0.04	31.64
Finland	165	1.6	1.81	0.07	9.69
France	2879	5.62	6.08	0	40.02
Greece	101	13.88	12.95	0	40.02
Ireland	96	4.65	7.71	0	40.02
Italy	9216	8.22	7.64	0	40.02
Lithuania	123	10.05	9.91	0.06	40.02

Luxembourg	133	4.82	7.97	0	40.02
Latvia	228	11.41	11.36	0	40.02
The Netherlands	85	3.72	5.78	0	40.02
Portugal	865	7.09	6.48	0	40.02
Slovak Republic	219	8.07	7.76	0.05	40.02
Slovenia	219	10.5	9.14	0.2	40.02
N	24003				

Source: Fitch, author calculations.



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Model estimates of NPLs of a large sample of banks in the euro area suggest that macro-economic factors drive NPLs. This implies that the NPL-ratio may not increase in a similar fashion as after the global financial crisis. However, the low fit of the model shows that idiosyncratic factors play a major role in explaining NPLs. This is illustrated in a case study for the Netherlands which suggests that deferred tax payments may lead to increasing NPLs.

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