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Loan loss provisions and macroeconomic shocks: Some empirical evidence for italian banks during the crisis

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ABSTRACT

This paper uses data from a panel of more than 400 Italian banks for the period 2001–2015 to examine the main determinants of loan loss provision (LLP), which are classified as either discretionary (income smoothing, capital management, signalling) or non-discretionary (related to the business cycle). The possible effects of the double-dip recession of 2008–9 and 2011–15 are also examined. The results suggest that LLP in Italian banks is countercyclical, with non-discretionary components and macroeconomic shocks playing a significant role. Moreover, LLP is less cyclical in the case of local banks, since their loans are more collateralised and their behaviour is more strongly affected by supervisory activity.

1. Introduction

During the last decade, the European economy has experienced one of the deepest recessions of the post–war period. The banking sector was significantly affected by the crisis: bad loans piled up, both reducing revenues and increasing loan loss provisions (LLP), which led to further revenue losses. This has made LLP behaviour a crucial issue to be investigated. In particular, the Italian economy was severely affected by a double-dip recession that was deeper and longer than those experienced by other Eurozone countries and also had a bigger impact on non-performing loans and consequently on LLPs of Italian banks. The presence of over three hundred small local cooperative banks makes the Italian case even more interesting. The main function of LLP is to cover expected losses; however, it can also be an important tool to pursue other objectives, such as stabilising earnings and dividends over the cycle. Most recently several supervisory authorities, including the Bank of Italy, have put pressure on the banking industry to assess accurately the quality of loans and to make adequate provision for the increasing credit risk, even though there is no specific legislation establishing a minimum amount of LLP to be held against nonperforming loans (NPLs).

The existing literature suggests that LLP can be affected by at least three types of factors, i.e. the economic cycle, discretionary and non-discretionary behaviour of bank managers. The-non discretionary component is related to credit risk and its aim is to cover expected future credit losses on loans (Wahlen, 1994; Beaver and Engel, 1996). The possible discretionary components may reflect motives regarding capital management, income smoothing and signalling. According to the capital management hypothesis, less capitalised banks should be less willing to make LLP. More precisely, LLP reduces Tier 1 capital and is deducted from risk-weighted assets when calculating Tier 2 capital. If the increase of Tier 2 capital associated with a higher level of LLPs is larger than the decrease in Tier 1 capital, discretionary behaviour could lead to an increase in regulatory capital without a corresponding reduction in the insolvency risk (regulatory capital arbitrage). As a result, less capitalised banks are expected to be less willing to make LLP. This is normally tested by using the deviation of the Total Capital Ratio from 8% divided by 8% ($CAP_{i,t}$), as in Bouvatier and Lepetit (2008) and Bouvatier et al. (2014), or the simple ratio of total equity to total assets, as in Bikker and Metzemakers (2005) and

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Table 1
Results from Eq. (1).
Source: Authors'calculations using data from Istat and ABI (Italian Banking Association).

Regressors	Dependent variable: $LLP_{i,.t}$			
	Eq. (1)	Eq. (1)	Eq. (1)	Eq. (1)
Constant	−0.0104***	−0.0105***	−0.0105***	−0.0105***
$LLP_{i,t-1}$	0.0752**	0.0712**	0.0712**	0.0776**
$NPL_{i,t}$	0.2844***	0.2830***	0.2830***	0.2841***
$\Delta NPL_{i,t+1}$	0.0026	0.0021***	0.0021	0.0028
$LOAN_{i,t}$	0.0157***	0.0152***	0.0152***	0.0158***
ΔGDP_t	0.0582***	0.0565***	0.0565***	0.0576***
$CRISIS_t$	0.0009***	0.0015***	0.0015***	0.0009***
ΔGDP_t *$CRISIS_t$	−0.0573***	−0.0553***	−0.0553***	−0.0567***
$IS_{i,t}$	−0.0566**	−0.0133	−0.0681***	−0.0551**
$IS_{i,t}$*$CRISIS_t$	–	-0.0548	–	–
$IS_{i,t}$*$NOCRISIS_t$	–	–	0.0548	–
$CAP_{i,t}$	-0.0001	–	–	–
$SIGN_{i,t}$	–	–	–	0.0001***
Observations	5581	5581	5581	5581
Interacted Dummies	Yes	Yes	Yes	Yes
R^2	0.8517	0.8515	0. 8515	0.8527
#Instruments	87	87	87	55
VCE robust	Yes	Yes	Yes	Yes
AR(2) Test (p-value)	0.5624	0.6404	0.6404	0.4643
Wald test (p-value)	0.0000	0.0000	0.0000	0.0000

Note. The results are from Eq. (1). The dependent variable is the ratio of Loan Loss Provisions on Bad Loans to Total Assets. $NPL_{i,.t}$ is the ratio of Bad Loans to Total Loans. $\Delta NPL_{i,.t+1}$ is the one period ahead first – difference of $NPL_{i,.t}$. $LOAN_{i,.t}$ is the ratio of Total Loans to Total Assets. ΔGDP_t is the annual growth of real GDP. $CRISIS_t$ is a dummy variable that takes value 1 during the periods 2008–2009 and 2011–2015. ΔGDP_t *$CRISIS_t$ is the interactive variable between ΔGDP_t and $CRISIS_t$. $NOCRISIS_t$ is a dummy variable that takes value 1 when $CRISIS_t$ equal to 0. $IS_{i,.t}$ is the ratio of earnings before interest, taxes and loan loss provision to total assets. $IS_{i,.t}$*$CRISIS_t$ is the interactive variable between $IS_{i,t}$ and $CRISIS_t$. $IS_{i,.t}$* $NOCRISIS_t$ the interactive variable between $IS_{i,t}$ and $CRISIS_t$. $CAP_{i,.t}$ is a dummy variable that takes value 1 if the bank has a Tier1 Ratio greater than that for the 75th percentile of the sample distribution and 0 otherwise. $SIGN_{i,.t}$ is the one – year ahead percentage change of $IS_{i,.t}$.
The regression method is the Arellano-Bond two-step estimator. *, ** and *** indicate statistical significance respectively at the 10%, at 5% and at 1% level.

Soedarmono et al. (2012). We use a dummy variable ($CAP_{i,t}$) which is equal to 1 if the bank has a Tier 1 ratio greater than that for the 75th percentile of the distribution of the full sample of banks, 0 otherwise. The income smoothing hypothesis implies that banks should decrease (increase) LLP when earnings are expected to be low (high). This hypothesis is tested using the ratio of earnings before interest, taxes and LLP to total assets ($IS_{i,t}$), as in Anandarajan et al. (2006), Bouvatier and Lepetit (2008), Soerdamono et al. (2012) and Bouvatier et al. (2014). Finally, banks ca use LLP to signal their financial strength (Ahmed et al., 1999; Kanagaretnam et al., 2005). To test this hypothesis, we use the one-year-ahead change of earnings before taxes ($SIGN_{i,t} = IS_{i,t+1} - IS_{i,t}/IS_{i,t}$), an adjusted version of the weighted one considered by Anandarajan et al. (2006), Bouvatier and Lepetit (2008), Soedarmono et al. (2012) and Bouvatier et al. (2014). The sign of the coefficient on earnings could be either positive or negative: if banks use provisions to smooth earnings, the expected sign is positive; however, a negative sign is also possible owing to pro-cyclical effects.

2. The model

The determinants of LLP in Italian banks are analysed following a similar approach to Bouvatier and Lepetit (2008), Soerdamono et al. (2012), Packer and Zhu (2012) and Bouvatier et al. (2014). The model is specified as follows:

$$LLP_{i,t} = \beta_0 + \beta_1 LLP_{i,t-1} + \beta_2 NPL_{i,t} + \beta_3 \Delta NPL_{i,t} + \beta_4 LOAN_{i,t} + \beta_5 IS_{i,t} + \beta_6 CAP_{i,t} + \beta_7 SIGN_{i,t} + \gamma_j BCV_{j,i,t} + \delta_t + \varepsilon_{i,t} \quad (1)$$

where the dependent variable $LLP_{i,t}$ is the ratio of LLP to total assets for bank *i* and year *t*, $NPL_{i,t}$ is the ratio of non-performing loans to total loans, $DNPL_{i,t}$ is calculated as follows: $DNPL_{i,t} = NPL_{i,t+1} - NPL_{i,t}$ (both $NPL_{i,t}$ and $DNPL_{i,t}$ are expected to have a positive effect on LLP, since they are a function of the expected credit risk), $LOAN_{i,t}$ is the ratio of total loans to total assets (also expected to have a positive relationship with LLPs since loan growth is one of the sources of bank credit risk), $IS_{i,t}$ is the ratio of earnings before interest, taxes and LLP to total assets, $CAP_{i,t}$ is a capital management variable, as previously defined, $SIGN_{i,t}$ is the one-year-ahead change of earnings before taxes ($SIGN_{i,t} = (IS_{i,t+1} - IS_{i,t})/IS_{i,t}$), an adjusted version of the weighted one considered by Anandarajan et al. (2006), Bouvatier and Lepetit (2008), Soedarmono et al. (2012) and Bouvatier et al. (2014), $BCV_{i,t}$ are the business cycle variables (ΔGDP_t the annual rate of change of Italian GDP, $CRISIS_t$ a dummy variable for the Italian double dip economic recession, equal to 1 for the years 2008–2009 and 2011–2015 and 0 otherwise). The estimation method is the generalised method of moments (GMM) with regressions in first differences (see Arellano and Bond, 1991). The sample is an annual unbalanced panel of Italian banks'