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**MACROECONOMIC AND BANK-SPECIFIC DETERMINANTS OF  
NON-PERFORMING LOANS IN THE EUROPEAN AND ITALIAN  
CONTEXT**

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## ABSTRACT (ITALIANO)

Questo elaborato analizza i risultati ottenuti dalla letteratura accademica riguardo alle determinanti macroeconomiche e bancarie che sono relazionate con i “non-performing loans” (NPLs), ossia i crediti deteriorati. Infatti, dalla Grande Recessione del 2008, gli stati europei hanno subito un ingente aumento della quantità di NPLs, i quali hanno contribuito all’inasprimento della crisi economica di quei anni. In questo contesto, l’Italia ancora presenta il volume più grande di crediti deteriorati (EUR 159.0 bn), mentre Grecia e Cipro rappresentano i paesi con la più grande percentuale di NPLs, rispettivamente del 44.8% e del 34.6%. Inoltre la ricerca propone una breve valutazione degli strumenti bancari e delle autorità centrali per facilitare la risoluzione dei crediti deteriorati dove vi siano situazioni particolarmente critiche. La tesi è dunque divisa in tre capitoli. Il Capitolo 1 esamina la definizione formale e gli standard contabili dei NPLs in Europa, contestualizza una serie di dati rilevanti riferiti alla situazione europea ed italiana, ed infine valuta le conseguenze sul sistema bancario in termini di liquidità e di offerta di prestiti. Il capitolo 2 si concentra invece sulla letteratura accademica concernente sia le variabili macroeconomiche sia quelle bancarie che influenzano la quantità di NPLs. Il Capitolo 3 offre infine una valutazione degli strumenti che banche ed autorità centrali possono implementare per risolvere o quantomeno ridurre il problema dei crediti deteriorati.

## ABSTRACT

This thesis analyses the results obtained by the academic literature about the macroeconomic and bank-specific determinants that are related to non-performing loans (NPLs). It additionally examines the evolution and consequences of the non-performing loans (NPLs) in Europe, with a special focus on the Italian context. In fact, since the Global Financial Crisis of 2008, the European states have been affected by a severe increase in the volume of NPLs which contributed to the worsening of the economic downturn in those years. In this background, Italy still presents the largest stock of NPLs in Europe (EUR 159.0 bn), while Greece and Cyprus represent the countries with the highest NPL ratios, respectively of 44.8% and 34.6%. Furthermore, the research proposes a brief evaluation of the instruments of banks and central authorities to the facilitation of the resolution of NPLs in critical situations. The dissertation is hence divided into three chapters. Chapter 1 examines the formal definition and the accounting standards of NPLs in Europe, it presents the relevant data in the European and Italian context and it finally evaluates the consequences on the banking system in terms of liquidity and supply of loans. Chapter 2 is instead concentrated on the academic literature concerning both the macroeconomic and the bank-specific variables affecting NPLs. Chapter 3 finally offers the

evaluation of instruments that banks and central authorities can implement to solve or at least reduce the issue of NPLs.

## CHAPTER 1: ANALYSIS AND DIFFUSION OF NPLs

### RISK, DEFINITION AND ACCOUNTING STANDARDS OF NPLs

#### BANKING PRACTICE AND RISK

The main activity of banks is to collect public savings, in the form of deposits, and invest them issuing credit to firms and individuals. The exercise of lending is therefore inherently affected by risk, because of the possibility that borrowers fail to fully repay the debt. The notion of risk, in all of its forms, is thus the main variable that banks necessitate to accurately manage. There are three major concepts that measure risk for banks. The first is the probability of default (PD), that measures the possibility of not having the credit paid back. The second notion is the loss given default (LGD), that is the expected value of the ratio between the loss deriving from the default and its total exposition. The third is exposure at default (EAD), that consists of the total value a bank is exposed in case of default of the counterparty. The product of these three components estimates the expected loss that the bank is facing. All these concepts are the foundations of the management of these problematic loans, which are usually named as non-performing loans (NPLs), whose formal definition is outlined in the following paragraph.

#### DEFINITION OF NPLs

##### *EU Standards*

Non-performing loans (NPLs) are credits for which the payment is uncertain. However, it does not exist a unique standard for the formal definition of NPLs. This creates problems of identification and comparison of NPLs between different institutions. However, in 2013 the European Banking Authority (EBA) published the criteria for the harmonisation of the concept of NPLs, in order to process homogenous data from the different banks in Europe. These guidelines were implemented by the European Commission in Regulation (EU) No 680/2014 and they are also summarised by the ECB (2017) in its report “Guidance to banks on non-performing loans”, which draws a complete manual for banks the identification of NPLs. In that document the concept of NPLs is also interchangeably referred with the term of non-performing exposures (NPEs). NPEs are exposures that comply with either or both of the two following principles:

- Material exposures which are more than 90 days past-due. Materiality refers to the threshold of relevance beyond which financial information is significative for decision making.

- The debtor is evaluated 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.

The former is thus mentioned as the “past-due” criterion. It fixes this limit to 90 days, beyond which exposures are considered non-performing. Clearly, it refers to exposures whose legal obligation of the payment is compulsory, otherwise the absence of payment is not assessed as a violation. Instead, the latter is referred to the “unlikely-to-pay” principle. This norm defines some events that cause the classification in non-performing loans, even if the 90 days of retarded payment have not occurred. Because it relies on less quantitative criteria, giving space for interpretation, it is necessary that banks adopt internal indicators of the recognition of unlikely-to-pay events, especially the ones which have a standard of automatic identification.

Another source of confusion is the misalignment between the supervisory notion of NPLs, the regulatory definition of “default” (Article 178 Capital Requirements Regulations CRR) and the accounting classification of “impaired” (IAS 39.58 and IFRS9). Although for most exposures the three concepts are aligned, NPE is a notion conceptually broader than the definition of “default” and “impaired”. Apart from the technicalities (see also Appendix 2), for the purpose of this report, it is important to consider that, when they are identified, defaulted and impaired exposures are mandatorily considered as NPEs.

Furthermore, the ECB (2017) clarifies the notion of “forbearance”. Forbearance refers to the concessions that, in the form of contractual modifications of terms and conditions or partial refinancing of the loan, are applied to some exposures. They are not agreed only with borrowers showing financial difficulties, but also with debtors affected by significant alterations of market conditions that could impact on their ability to repay debts in the future. For this reason, the “forborne performing exposures”, regarding solvent debtors, are distinguished from the “non-performing exposures with forbearance measures”, that are fully considered part of the NPEs. For the latter situation, in case of the positive outcome of the forbearance, NPEs have to pass to “cure period”, in which have to demonstrate the ability to fully repay the debt, as the other loans becoming re-performing.

In addition to the harmonisation of the NPLs, the Regulation (EU) No 680/2014 of the European Commission implemented also the Single Supervisory Mechanism (SSM) to rely on a single regulatory entity, which had the aim of strengthening the banking system after the Global Financial Crisis. SSM is meant to monitor the operations of the major European banks and, through the practice of Asset Quality Reviews (AQRs) and Stress Tests (STs), to respectively

enhance the transparency of bank exposures and test the resilience of their balance sheets. This can build confidence also to support the strengthening of the secondary market of NPLs and to produce disincentive for opportunistic banking practices.

#### *Bank of Italy categorisation*

Despite the harmonisation of the aggregate notion of NPLs (in Italian “crediti deteriorati”), the Bank of Italy, to preserve the continuity of historical data, prefers to adopt three different subcategories: although ECB divides the NPLs in “past-due” and “unlikely-to-pay” as the criteria of their identification, the Italian standard is to report data in the categories of bad loans (“sofferenze”), unlikely-to-pay (“inadempienze probabili”) and past-due (“esposizioni scadute o sconfinanti”).

- Bad loans (“Sofferenze”): are all the exposures to debtors in state of insolvency or comparable situations.
- Unlikely-to-pay (“Inadempienze probabili”): are exposures, not included in “bad loans”, that are considered from the bank as unlikely-to-pay without the realisation of collaterals.
- Past-due (“Esposizioni scadute o sconfinanti”): are the exposures, not counted in “bad loans” and “unlikely-to-pay”, that are past due more than 90 days and reach a determined threshold of materiality.

Although the last two notions resemble the ECB’s categories, the addition of the group of bad loans (“sofferenze”) misalign the comparability with the two standards of subcategories.

## INTERNATIONAL ACCOUNTING STANDARDS

Similarly to the definition of NPLs, it does not exist a global accounting standard. Moreover, in Europe, the accounting standards are passing through a substantial reform. In January 2018 the International Financial Reporting Standard 9 (IFRS 9) substituted the previous standard of IAS 39. The main change is regarding the approach implemented for the calculations of credit losses; in fact, it entails the switch from the incurred loss model into the expected credit loss paradigm.

The incurred loss model recognised losses only after the loss event had happened. Indeed, expected losses of future events could not be considered, whereas only past and current



conditions were regarded. Firms had also to provide a detailed analysis for the past-due financial assets, while, for the other categories of loans, they had to report only general credit quality information without any standardised criteria indicated by the regulator (Bholat et al., 2016). This created a misalignment of the contents of these disclosures about not impaired assets, with the drawback of not fully incorporating information about future expectations of credit quality.

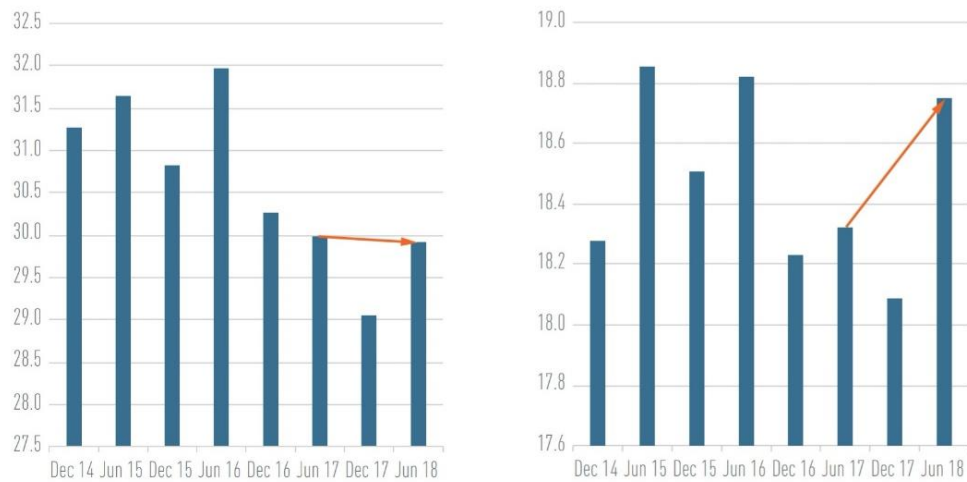
The expected loss model offers more accurate guidance on the managing of risk. Its aim is to strengthen the loan-loss provision standards by incorporating a broader variety of credit information. The expected loss model is divided into three stages. “Stage 1” incorporates all the assets for which it is not registered any significant increase of the credit risk and it sets a provision from expected losses over the following 12 months. In “stage 2”, in which are considered assets with increased riskiness, the provisions are augmented considering the expected loss of the whole future lifetime of the loan. Finally, “stage 3” reports incurred losses that are derived from real repayments. Thus, this methodology reinforces provisions also from expectations of future losses. However, the computation of forward-looking calculations is still subjected to discretion, which could also lead to opportunistic behaviour of managers. Furthermore, even if in this model provisions are raised earlier, provisions could not always cover all incurred losses. A final issue is derived from the fact that firms are not obliged to disclose their internal criteria for the recognition of the deterioration of credit risk, so users might not be able to completely understand these variations of loan classification in the financial statement (Bholat et al., 2016).

## CONTEXT AND DATA OF NPLs

### NPLs IN EUROPE

After the Global Financial Crisis of 2008, the stock of NPLs had consistently risen, while in recent years data indicate a progressive recovery. According to the European Banking Authority (EBA) (2018a; 2018b), in June 2018 the total assets of the European banks were worth EUR 29.9 tn. On this volume, the total loans and advances amounted to EUR 18.7 tn, that corresponded to 63% of the total, while the remaining part was primarily distributed between debt securities (13%), cash balances (9%) and derivatives (8%). Fig.1 suggests the latest favourable trend of macroeconomic conditions: although the total assets have globally diminished since the previous year, the increase of loans and advances of more than EUR 420 bn (+2%) indicates that banks were encouraged to extend their lending.

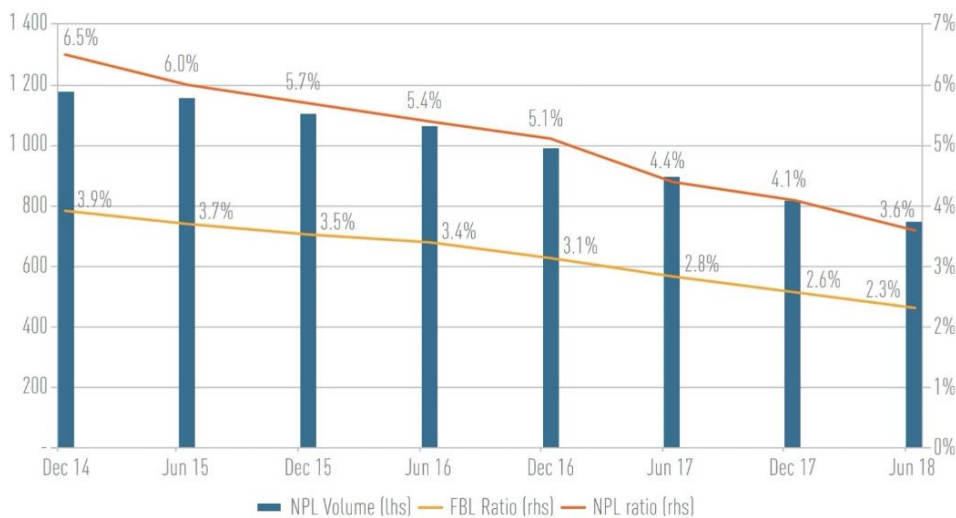
Fig.1 Total asset (left) and loan (right) volumes (EUR tn)



Source: EBA (2018a)

The macroeconomic situation has also impacted on the volume of NPLs. In June 2018, the amount of European NPLs was EUR 746 bn, which corresponded to 3.6% of average NPL ratio (see also Fig.2). This ratio has significantly improved in the last years, -0,8% (4.4%) since previous year and -3.0% (6.6%) since 2014, when European countries converted in a common definition of NPLs (see also Fig.2). Despite the positive trend, the NPL ratio in Europe remains considerably higher in comparison to Japan (1.2%) and the US (1.1%).

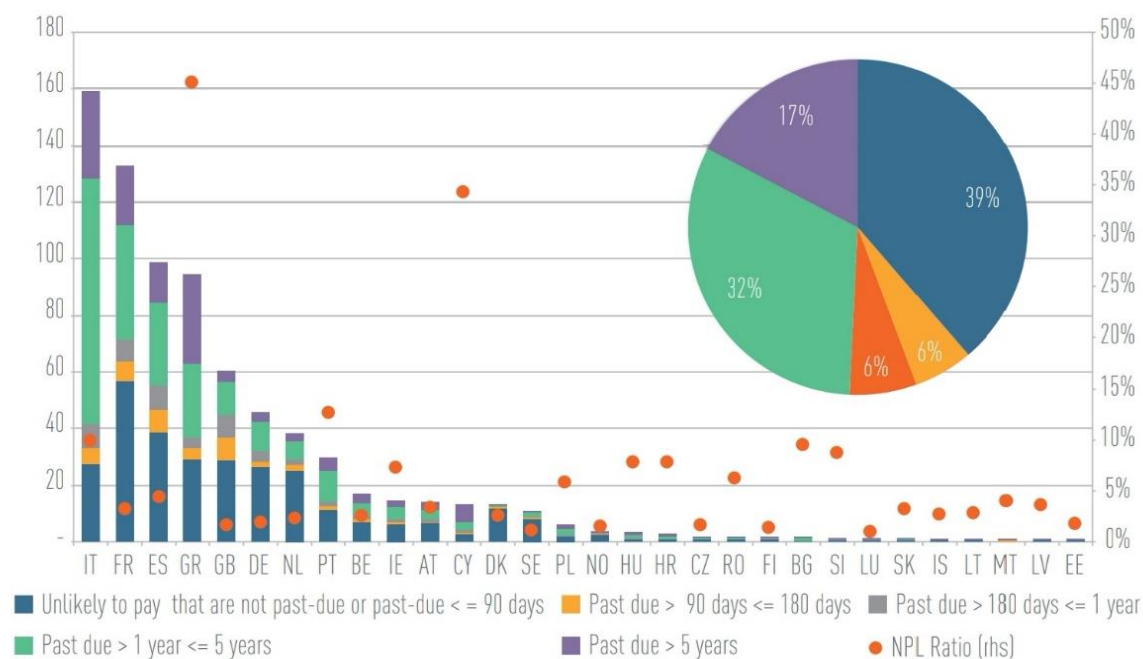
Fig.2 EU banking sector NPLs (EUR bn) and ratios of NPLs and forborne loans (%)



Source: EBA (2018)

Regarding the composition of the NPLs, Fig.3 shows a significant data: 39% of the loans were indicated as unlikely-to-pay and so less than 90 days past due, 12% was unpaid for between 90 days and 1 year, 32% between 1 year and 5 years and finally the remaining 17% consisted of payments in a lag of more than 5 years. Countries with a minor level of NPLs documented a significantly higher percentage of NPLs past due less than 1 year (considering also unlikely-to-pay loans). Contrarily, high-NPL countries have a larger share of loans more than 1 year past due. This could indicate that early recognition of NPLs and apposite intervention measures positively impact in addressing NPLs and in lowering their levels. It could also suggest that NPLs more than 1 year past due are more problematic to reduce in comparison to the ones that have only lately entered in the classification on NPLs. As shown in Fig.3, Italy results to be the country with the larger share, in absolute term, of NPLs (EUR 159bn), with a consistent portion of problematic loans more than 1 year past due. While in relative terms, the countries most affected by NPLs are Greece (44.8%) and Cyprus (34.6%), followed by Portugal (12.4%), Italy (9.7%), Bulgaria (9.3%) and Slovenia (8.5%). Of the developed economies, the healthier in terms of NPL ratio emerged to the UK (1.4%) and Germany (1.7%), with France (3.0%) slightly above their percentage.

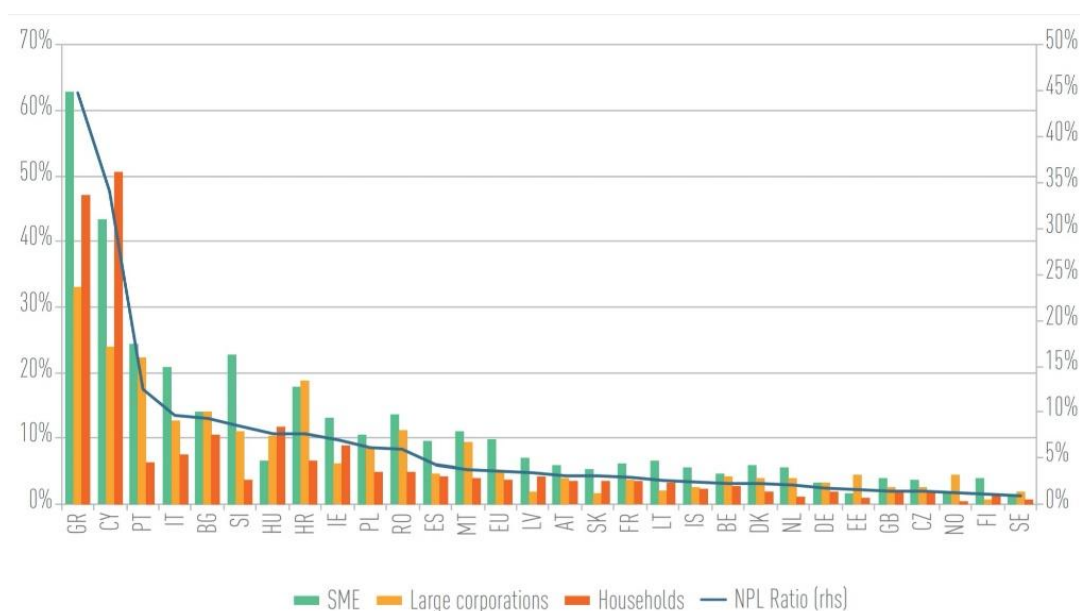
Fig.3 Unlikely to pay and days past due bands of NPLs: volumes per country by past-due time bands (EUR bn) and EU distribution (%) and NPL ratios (%) — June 2018



Source: EBA (2018a)

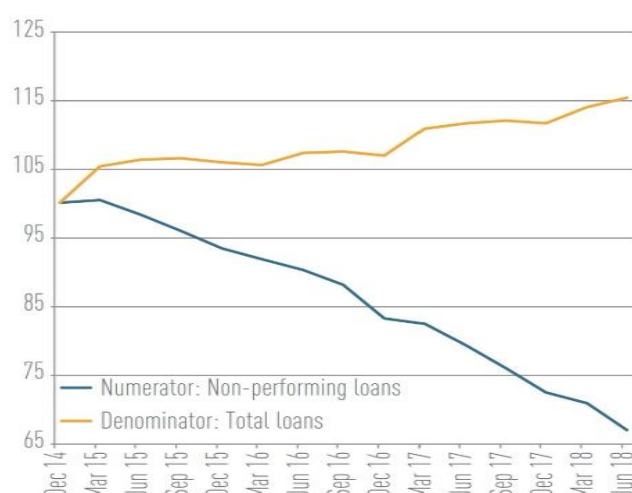
As previously mentioned, the trend saw a reduction of NPLs across the EU states, specifically of -0.8%, passing from 4.4% of June 2017 to 3.6% of the following year. This decrease was mainly driven by a diminution of the numerator, namely the total stock of NPLs, which lowered by 15% in the last year, while the denominator, that is the amount of total loans, slightly increased producing a minor contribution of the ratio. The most intense reduction happened in some of the countries severely affected by NPLs, like Cyprus (-8.6%), Portugal (-5.0%) and Slovenia (-4,8%). Instead, Fig.4 indicates for each country the dispersion of NPLs among the three categories of small and medium enterprises (SME), large corporations and households. The most exposed category is SME with an average NPL ratio of 9.8% (13.5%, in June 2017), while the percentage is 5.0% (6.2% in June 2017) for large corporations and 3.7% (4.3% in June 2017) for households.

Fig.4 NPL ratios by sector and overall NPL ratio (%) — June 2018



Source: EBA (2018a)

Fig.5 Numerator and denominator trends (2014=100)



Source: EBA (2018a)

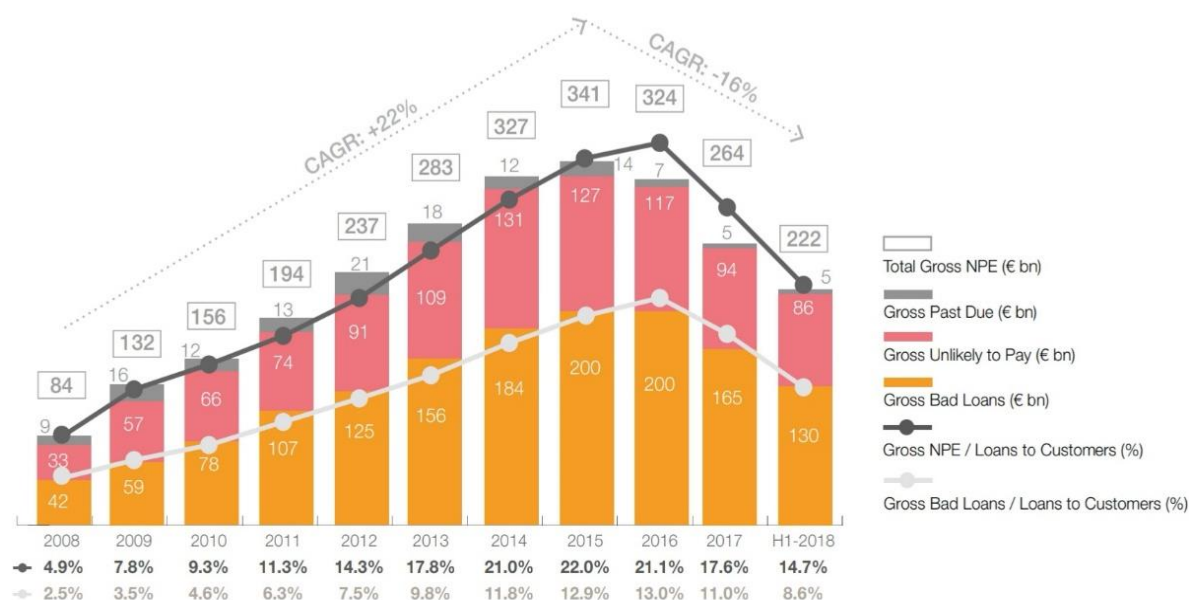
The introduction of the IFRS9 standard, based on the expected loss model, entailed the classification of loans in three stages to calculate provisions, as previously explained. The average in the European countries was that around 88% of the loans were categorised in Stage 1, while Stage 2 around 8% and Stage 3 around 4%. It is expected that the introduction of this accounting standard will increase the loan loss provisions, with an impact also on the capital ratios, in particular on CET1 ratio, that measures the most secure portion of capital, mainly consisting in equity and retained earnings, so that it could averagely diminish, putting a downward pressure on the growth of total loans in the next years of arrangement to the new standard.

## NPLs IN ITALY

Italy is one of the countries that most suffered from the Global Financial Crisis in 2008. From 2007 to 2017, Italy has recorded an overall GDP diminution of 5% (see also Appendix 1). This economic downturn affected also the volume of problematic loans, which became the highest in Europe in these last years. According to EBA (2018), in June 2018 the Italian stock of NPLs amounted to EUR 159.0 bn on a total of EUR 1,634 bn of loans, which implies an NPL ratio of 9.7%. Other sources, like PwC (2018) and KPMG (2018), considering the data from the Bank of Italy, agree on a higher estimation, as shown in Fig.6, with EUR 222.0 bn of NPL stock and 14.7% of NPL ratio. In Fig.6 are also presented the historical data since 2008 and it is possible to appreciate the impact of the crisis, which caused the stock of NPL to grow from EUR 84 bn of 2008 to the peak of EUR 341 bn in 2015, which was stopped by the latest recovery trend.

Indeed, from 2015 to June 2018 the compound annual growth rate (CAGR) was -16%, deriving from a decrease of the NPL stock of EUR 119 bn. This reduction, although a slight decrease in the total amount of loans, entailed the NPL ratio to diminish from 22.0% to 14.7% in less than 3 years. About the composition of NPLs, using the Italian classification previously described, the actual volume of NPLs is composed by 58.6% of bad loans (“sofferenze”), 38.7% of unlikely-to-pay (“inadempienze probabili”) and only a remaining part of past-due (“esposizioni scadute”). This partition could suggest, as previously mentioned, a lack in the early recognition and intervention, but it is additionally explained by the extremely slowness of the Italian civil justice, because on average are necessary 1,120 days for the recovery of credit, while in the others European countries this time is significantly less, like France (395 days) or Germany (499 days) (see also Fig.7).

Fig.6 Evolution of NPL in Italy (bn of EUR)



Source: Pwc (2018)

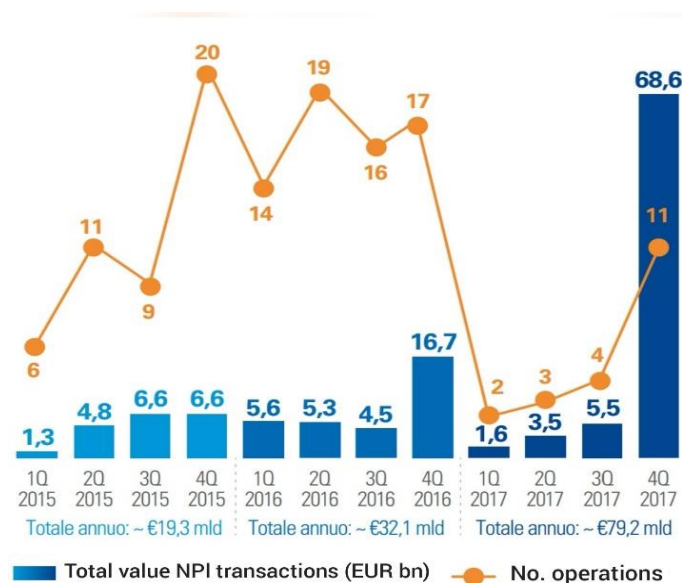
Fig.7 Average days for credit recovery

<i>Country</i>	<b>Days</b>
<i>Italy</i>	1,120
<i>France</i>	395
<i>Germany</i>	499
<i>Spain</i>	510
<i>UK</i>	437

Source: KPMG (2018)

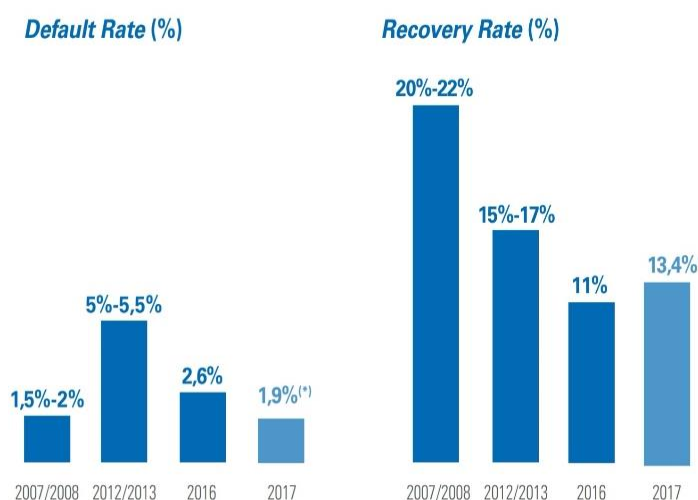
The decrease of NPL stocks since 2015, apart from favourable macroeconomic conditions, is explained by the necessity of deleveraging of the major Italian banks to meet the expectations of the investors and the new requirements indicated by the supervisory authorities. In fact, capital market investors are increasingly penalising, in terms of capitalisation, financial institutions with low asset quality, so that there is growing evidence of a negative correlation between the amount of NPLs of a bank and its price to book ratio (KPMG, 2018). For this reason, Italian banks are also intensively recurring to the sale of NPLs. Although, as shown in Fig.9, the default rate and the recovery rate are improving, leading to a positive flow of reduction of the total NPL volume, still KPMG's (2018) estimations calculate that without the practice of NPL sales, the "natural" reduction of NPLs to a safe threshold ratio of 7% or less could require till ten years to occur. Consequently, the Italian banks need to accelerate this process and this is signalled by the volume of NPL transactions, which from 2015 to 2017 consisted of EUR 130 bn (KPMG, 2018). Also Fig.8 suggests the progressive increase of this practice, especially in the last quarter of 2017. Nevertheless, 80% of the volume of transactions is generated only by a restricted amount of negotiations, also if securitisation, as an alternative method of transfer, is an augmenting trend which offers better pricing because of intensified market conditions. In this field, the introduction of GACS ("Garanzia Cartolarizzazione Sofferenze"), that consisted of the warranty of the state to senior notes issued from NPL securitisations, acted as an incentive to develop this market.

Fig.8 Volume transactions NPLs ( EUR bn



Source: KPMG (2018)

Fig.9 Evolution of default and recovery rates (%)



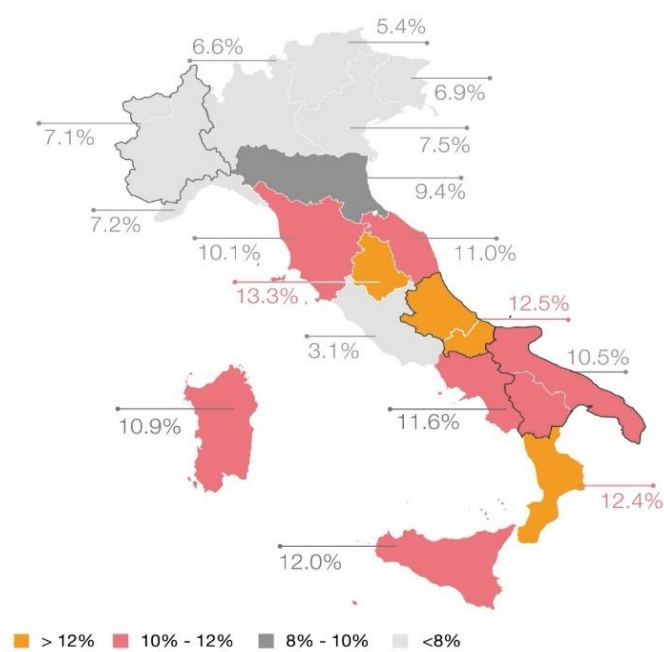
Source: KPMG (2018)

For a more complete insight of the Italian situation, Fig.10 analyses the distribution of bad loans (“sofferenze”) ratio per region: the central and the southern regions are more affected by this phenomenon, especially in Umbria (13.3%), Abruzzo and Molise (12.5%) and Calabria (12.4) where are found the highest ratios. Regarding the unlikely-to-pay (“inadempienze probabili”) NPL ratio, the context is quite aligned with the previous graph, except for Liguria (8.8%) where, despite a relatively restrained ratio of bad loans, for the unlikely-to-pay it reaches the Italian peak. The sectors most affected in Italy by NPL are manufacture and construction, which respectively represent 31% and 23% of the total bad loans (see also Appendix 3). While



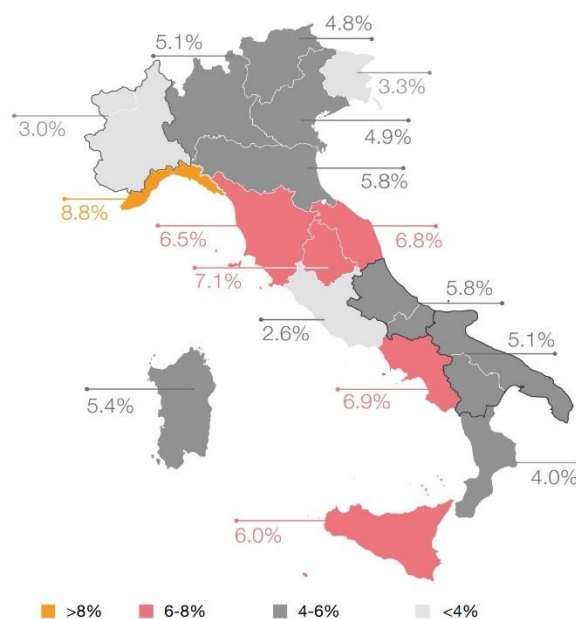
concerning the Italian banking sector, Fig.12 shows the gross NPL stock and the Texas ratio for the 10 major banks. The Texas ratio relates the net NPL stock with the tangible net assets of the firm in order to measure the ability of the bank to overcome the potential loss of these deteriorated assets. For this reason, the Texas ratio should always below 100%. However, this is not the case for 4 of the 10 major banks, signifying a condition of stress that is prolonging since the Global Financial Crisis.

Fig.10 Bad loans ratio per region



Source: PwC (2018)

Fig.11 Unlikely-to-pay loan ratio per region



Source: PwC (2018)

Fig.12 NPL stock (EUR bn) and Texas Ratio major 10 Italian banks



Source: PwC (2018)

## THE ECONOMIC IMPACT OF NPLs

### CONSEQUENCES ON BANKS

The presence of high levels of NPLs can affect the potential of banks to lend to the real economy because of three main drawbacks: it lowers the bank's profitability, it increases capital requirements and it also raises the costs of funding (Mesnard et al., 2016). More specifically, regarding the decrease in profitability, this is firstly due to the inherent costs of credit losses, but also to the implication of a rise in provisioning needs so as to cover the potential losses, consequently causing a reduction in capital and liquidity to fund new lending. Therefore, banks

observe a drop in their net operating income. In addition, profits are further restrained by the increase of operating costs, because high volumes of NPLs require human resources to measure, manage and monitor the NPL stocks. For instance, Carpinelli et al. (2016) show that in 2014 the credit recovery function weighed for 2.8% of the total operating costs for bank groups, counting administrative expenses and staff, provisions, adjustments and write-backs. Although this percentage varies widely between different banking entities, it is significative to our point its increase of 40% (so from 1.12% to 2.8%) in comparison to 2008, when the great recession started to cause the haemorrhagic expansion of NPL (Carpinelli et al., 2016). While concerning the capital requirements, as previously mentioned, the logic is straightforward. NPLs are assets that increase the risk weights in the capital-requirement calculations. This has the consequence of augmenting capital-requirement ratios with the effect of blocking resources directed to fund new credit. Alternatively, but with similar effects, banks can directly lower the size of the balance sheet, trying to reduce the risk weights on capital requirement. IMF (2015) estimated that in the Euro area, considering the burdensome quantity of impaired assets in 2014, a timely resolution of them could impact with a release of € 42bn of additional capital, liberating new lending of about 5% of the aggregate European GDP. Finally, the consequences of funding costs are derived by the inherent risk of NPLs. Banks and other investors require higher compensation to lend to riskier entities. Thus, borrowing banks which face a rise in NPLs, which logically has the effect of augmenting the overall riskiness of the firm, are subject to higher interest rates. Consequently, banks see their profits to decrease. This mechanism, similarly to capital requirements, acts also as an incentive for deleveraging, causing a further reduction of balance sheets and capability to supply credit. Eventually, all these drawbacks of the high levels of NPLs might generate a decrease in the credit supply and the mutual reinforcement of interest rates, leading to a situation of credit crunch, as this paper will outline with more accuracy in the following section.

Furthermore, a consistent part of the literature asserts that the levels of NPLs change also the attitude of banks towards risk. In this case, Accornero et al. (2017, p.8) emphasise the possibility for high-NPL banks to actuate a “gamble for resurrection” logic, for which financial entities begin to lend more rather than the competitors with the uncertain result of recovering from their competitive disadvantage. Moreover, there is a further motivation for this risk-taking strategy. This is called the “dilution effect”: NPL ratio can be temporarily reduced by issuing additional loans in order to gain short-term confidence to access credit (Cincinelli and Piatti, 2017, p.17). As it is outlined in part 2 of this report, these types of moral hazard have, however, a tendency to increase NPLs in the specific bank because of the hazardous risk-taking.

## SYSTEMIC IMPACT ON CREDIT

From the precedent paragraph we have hence outlined that NPLs, not only affects the profitability of banks, but also might restrain the ability to provide credit because of the necessity of shrinking balance sheets and of the effects of the increased costs of funding. On the other hand, a risk-taking behaviour of high NPLs banks can oppositely cause a credit expansion. Hence, the overall effect is not straightforward. Bending et al. (2014) empirically estimate that both NPL ratios and variations are negatively correlated with a net change of commercial and corporate loans in the subsequent year. Cucinelli (2015) confirms this result for Italy, underlying that NPLs, and the related loan loss provisions, negatively affect the bank supply of loans. Unfortunately, as emphasised by Accornero et al. (2017), there are pervasive issues of endogeneity that threaten the validity of the observations. They thus studied this relationship in a large dataset of Italian banks, because Italy experienced between 2008 and 2015 a severe increase in the NPLs while credit was shrinking and the real economy was facing two different recessions. They eventually end to two conclusions. The first is that an endogenous variation of NPLs, *per se*, is not proven to affect the lending supply of banks. In their study, the restriction of credit is mainly caused by a change in the demand side: financially-constrained firms tend to deleverage in averse macro-economic conditions, but in these circumstances the number of financially-constrained companies rises, so the overall effect is that precaution dominates and the demand for credit diminishes. The second conclusion they obtain is that, however, exogenous shocks on NPLs do have a negative impact on the banks' credit supply.

Therefore, despite these premises, the impact of NPL growth should still be considered a critical factor to prevent a credit crunch. To properly understand the dynamics of a credit crunch it is necessary to outline the other main form of risk that banks manage, namely liquidity risk. NPLs concern the exposure to credit risk and the potential impact on the balance sheet in terms of economic losses or reduced profits. Contrarily, liquidity risk is about cash flows, precisely in the form of meeting payment commitments in time. A credit crunch is triggered by economic losses on assets (in this case loans), but then continues and intensifies mainly in the form of variations in inter-bank lending compensations and behaviours, that means primarily rising interest rates. Bernake and Lown (1991) summarise how a credit crunch occurs. Initially, a first shock weakens the balance sheets of a consistent part of borrowers. It follows that these entities experience additional pressure to commit their cash flows. In fact, the downgraded creditworthiness of these firms increases the difficulty of external funding, which results in increased interest rates for financing their activities. Consequently, this situation generates an

alarming vicious circle. The augmented pressure on firms causes a rise in bankruptcies, that consequently further worsens borrowing conditions and costs that will affect the solvency and profitability of other companies. Thus, this uncertainty ends up in shrunk balance sheets of banks, that are threatened by the potential acquisition of toxic assets, and also in the deterioration of firms' profitability and production, that indicates a severe downturn of the whole real economy.

## SYSTEMIC IMPACT ON ASSETS

To a deeper understanding of the systemic impact that a rise in NPLs, concurrently with other factors, can cause on the real economy, it is necessary to analyse the effects of the shift of the banking practice towards a "collateral-oriented" logic (Minsky, 1986). This refers to the procedure of backing the loans with other assets offered as collateral in case of missed payment. The consequence is that the credit and the security markets became severely susceptible to their mutual variations. Mehrling (2011) precisely describes this change in the evolution of banking. In the last decades, the necessity for long-term funding, especially in the US, caused the shift of the banking practice from the emphasis on self-liquidating short-term commercial debts to the practice of "shiftability" of securities as a way to manage their liquidity (Mehrling, 2011, p.114). Thus, the impact of a variation of the liquidity of the banking system has severe consequences on the values of assets. During the economic upturn, excessive lending fuels the acquisition of securities, which consequently appreciate. In this way, financial institutions assist in an upward revaluation of their existing inventories so that, because they can also be used as collaterals, they improve the individual creditworthiness of banks. Therefore, financial organisations can access new cheaper credit that finally puts further pressure on the appreciation of securities. But on the other end, during the economic downturn, the price-credit feedback mechanism dangerously acts as a vicious circle in the opposite way. Vulnerable debtors, exhausting their cash balances, incur in expensive borrowing conditions because of their worsened creditworthiness and so they are ultimately obliged to sell their assets. The excess of this supply ends up with a depreciation of asset prices that subsequently impacts the economic stability of other firms. As a consequence, the valuation of collaterals becomes uncertain, the credit lines shrink and liquidity issues arise in all the economy, evolving in some cases in insolvencies, which affect the real economy with a fall of production and employment. It is in this context of the "inherent instability of credit" (Mehrling, 2011, pp.12-17) that the role of good lending becomes vital. In this sense, NPLs can be seen as a consequence of the quality of loans. Although it exists a "natural" presence of NPLs, just as a probabilistic realisation of

improbable events, developed countries experienced also a diffused bad lending that led to the rise of the NPLs for the financial shock of the Global Financial Crisis of 2008.

## CHAPTER 2: MACROECONOMIC AND BANK-SPECIFIC DETERMINANTS OF NPLs

### MACROECONOMIC VARIABLES

#### GDP

According to Carey (1998), the state of the economy is the single most determinant systematic variable that influences diversified debt portfolio loss rates. GDP is one of the main indicators of the state of an economy because it measures its annual output of production. Several academics convey to this indication from their empirical studies emphasizing that GDP growth is the factor with the clearest relation with NPLs. The correlation between the two variables is unambiguously negative because the GDP growth has a rapid transmission effect on the capability of economic agents to repay their loans (Salas and Saurina, 2002). Moreover, according to Louzis, Vouldis and Metaxas (2011), the effect variations of GDP has an intensified effect on business NPLs in comparison to the categories of mortgages and households, especially when the country relies more on small size enterprises because of limited diversification of their business and thus their vulnerability to economic shocks.

#### UNEMPLOYMENT RATE

The unemployment rate shows a clear positive correlation with NPLs. Indeed Laurence (1995) in his model explains that the probability of default increases when the unemployment rises, and that is because low-income debtors face an augmented risk of losing their wages that finally affects their ability to settle commitments. Moreover, a rise in the unemployment rate is commonly linked with an economic downturn which reduces the production of services and goods. Oppositely, periods of a developing labour market and a sustained economic growth improve the financial stability of debtors which are therefore less likely to default. Bofondi and Ropele (2011), Louzis, Vouldis and Metaxas (2011), Messai and Jouini (2013) and Anastasiou, Tsionas and Louri (2016) among other academicians empirically confirm this supposition.

#### INTEREST RATE

A rise in the short-term interest rates is likely to cause a worsening of the NPL ratio for three main possible explanations. Firstly, high-interest rates imply an increased cost of capital for economic agents in order to fund their investments. This implies that the profitability of investments declines while at the same time their risk of inducing financial losses grows. Secondly, in the case of variable interest rate contracts, the potential increase of the rates has a direct impact on the costs of loans leading to more frequent episodes of insolvency. Furthermore, higher interest rates can result in an adverse selection of borrowers, with only the riskier debtors willing to accept the more severe conditions of the loans. Thus, all these reasons generate the expectation that the lending rates have a positive relationship with the NPL ratio.

Berge and Boye (2007), Beck, Jakubik and Piloju (2013) and Messai and Jouini (2013) provide evidence for corroborating the assumption. In particular, referring to Louzis, Vouldis and Metaxas (2011), consumer NPLs show to be the most sensitive category of loans to changes in lending rates. This could be explained also by the fact that consumer loans are more likely to be agreed on floating-rate terms, while for example mortgages, which are less severely affected by the variations of the interest rate, are usually stipulated in fixed-rate terms. Finally, Bofondi and Ropele (2011) analyse the effects of the steepening of the yield curve on NPLs, because it could indicate positive outlooks regarding the real growth of the economy, but they eventually do not find empirical confirmation of this hypothesis.

## SOVEREIGN DEBT AND TAXES

Reinhart and Rogoff (2010) support the possibility, as happened in Greece, that sovereign debt can trigger a banking crisis, also if other academics usually sustain the inverse causality between the two variables. They, in fact, identified two potential channels of transmission: the first is that the deterioration of the credit ratings of the State lowers the credibility and creditworthiness of national banks, that consequently observe higher constraints and costs for funding their liquidity; the second is that a high public debt will probably cause the growth of fiscal pressure or reduction in the social expenditure. This could act as a negative shock to households and firms. Louzis, Vouldis and Metaxas (2011) and Makri, Tsagkanos and Bellas (2013) confirm their hypothesis, finding also that the effect is stronger for business NPLs, mainly because of the negative consequences for the access to credit as previously mentioned. Furthermore, Anastasiou, Tsionas and Louri (2016) consider, in addition to the public debt, also the variables of the taxation of personal income and the government budget expenditure. Both variables are found to be positively related to the NPL ratio. Apart from the results about the taxation factor that are aligned with the expectations, it is more interesting to notice that the positive relationship with the government expenditure suggests that a restrictive fiscal policy has a better influence on the NPL ratio.

## INFLATION

Academics recognise that the effects of consumer price inflation on NPLs is not straightforward. On the one hand, a diffused idea is that a contained and stable inflation is a prerequisite for sustainable economic growth and so a positive relationship between inflation and the level of NPLs is expected. On the other hand, high inflation rates help the borrowers with a nominal-term denomination of their loans in servicing their commitments, because of the reduction of the real cost of the interest rate. Thus, this standpoint suggests a negative relation between inflation and NPLs. Shu (2002) finds empirical support for the latter



hypothesis, obtaining a significant negative relationship between the two variables in his regression, but other researchers, like Babouček and Jančar (2005) and Rinaldi and Sanchis-Arellano (2006), sustain the opposite point of view of a positive relationship between the consumer price inflation rate and NPLs. Furthermore, Bofondi and Ropele (2011) tested another variable of price stability, namely the annual growth rate of the M3 monetary aggregate, discovering, as supposed, that accelerating the growth of the money supply, which tends to intensify inflation, is an economic stimulus on future economic performances that consequently has the effect of reducing the levels of NPLs.

## SHARE AND HOUSE PRICE INDICES

The stock price index and the house price index might affect the number of NPLs because of their direct consequence of the wealth of borrowers. The stock price index is expected to be negatively correlated with the levels of NPLs because, when it increases, it reflects a confident outlook for the future performance of firms and also because it entails a bigger remuneration for stock investors giving them further income to service their loan obligations. The same relationship is predicted for the house price index for two main considerations. Firstly, the houses are usually acquired through the underwriting of mortgage loans, so that the rise of the value of the property offers an opportunity for an eventual more facilitated debt renegotiation. Secondly, market prices are related to the housing market cycle and this entails that debtors could more easily sell their estate and pay back their loans without the occurrence of default. Bofondi and Ropele (2011) analysing these two relationships found, contrarily to Kalirai and Scheicher (2002), no significant evidence for the stock price index, while they discovered a significant negative relation between the house stock index and the level of NPLs as previously obtained by Shu (2002).

## CURRENCY EXCHANGE RATE

The depreciation of the currency exchange rate does not have the same effect on the levels of NPLs for every country. Beck, Jakubik and Piloju (2013) found that exchange rate depreciation causes an increase of NPLs in countries where a significant part of the lending is in foreign currency to unhedged borrowers. This is explained by the fact that these debtors face increasing costs to repay the same nominal amount of foreign currency when their domestic currency devaluates, thus their probability to become insolvent increases. For instance, this circumstance is typical of the emerging economies with pegged currency rates, where hence the usual strategy is defending the exchange rate from fluctuations but, when the policy fails, exchange rate collapse affecting the real economy as during the Asian financial crisis of 1997. On the other hand, in open economies not exposed to this typology of currency mismatch, depreciation is

expected to have a negative relation with the amount of NPLs because of the benefit in the comparative advantage with other countries that tends to increase exports and consequently support the corporate sector. Beck, Jakubik and PiloIU (2013) empirically confirmed the hypothesis stating that in these countries the competitiveness channel prevails the negative effect on the balance sheet of the firms.

## BANK-SPECIFIC DETERMINANTS

### BAD MANAGEMENT

Berger and DeYoung (1997) support the hypothesis that low levels of efficiency are a signal of insufficient management quality. Consequently, the managers that are not sufficiently able to control the operating expenses are also more likely not to efficiently underwrite and monitor the loans. In particular, the administrative inadequacy could lead to inaccurate credit scoring, imprecise appraisal of the collaterals and insufficient monitoring and control of existing debts. Therefore, in addition to the low-cost efficiency in the short term, these inabilities generate in the future a higher volume of NPLs because of the accumulation in the portfolio of bad loans. Berger and DeYoung (1997) and Podpiera and Weill (2008) found empirical evidence of the bad management variable, while Salas and Saurina (2002) reject the assumption, which they found insignificant probably for the countereffect of the skimping factor that is analysed in the following paragraph. Moreover, Louzis, Vouldis and Metaxas (2011) tried to proxy the quality of the management with the lagged performances of the firm. In this context, the performance, captured by the return on equity (ROE) ratio, is found to be negatively related with the amount of NPLs for the subcategories of mortgages and consumers, while not significant for NPLs to businesses. This could signify that, although the case-by-case procedures to underwrite loans to business do not noticeably differ among banks, the different quality of the quantitative models used by banks for the credit ratings of households are a consequence of the managerial competence and eventually lead to lower levels of future NPLs.

### SKIMPING

The skimping hypothesis is antithetical with the bad management reasoning. The assumption is that there is an inherent trade-off between high cost-efficiency and the future quality of the loans. More precisely, the restrained costs imply low resources to underwrite new loans and accurately monitor the existing ones, leading in the long-term to a greater number of NPLs. Hence, under this assumption, there is a positive relationship between cost efficiency and NPLs. However, Louzis, Vouldis and Metaxas (2011) reject this hypothesis because the found evidence of the opposite sign of the relationship as assumed in the bad management supposition.

The same result is obtained by Godlewski (2004), Messai and Jouini (2013) and Anastasiou, Tsionas and Louri (2016) that confirm their outcome.

## MORAL HAZARD

Moral hazard is a post-contractual opportunistic behaviour that happens in a situation of information asymmetry because of the possibility of one party to change its conduct after the agreement of the deal. A typical situation of moral hazard is the behaviour of managers in contrast with the aim of wealth maximisation of stakeholders. There are many circumstances that can be categorised under this tag in the context of the management of risk in banks. One tested assumption of this genre refers to the incentive for the managers of low-capitalised banks to increase the risk-taking in the portfolio of loans in order to overcome in the short-term the competition. The direct consequence of this hazard is the following causation of high levels of NPLs. Thus, the hypothesis suggests a negative relation between the solvency ratio (owned capital divided by total assets) and the number of NPLs. Salas and Saurina (2002) provide empirical evidence showing a negative relation between lagged solvency ratio and NPLs. On the other hand, Louzis, Vouldis and Metaxas (2011) do not find evidence for the Greek banking sector, also if this could be possibly explained by the relatively small demand for banking managers, which can act as a disincentive due to reputations motives, and also by the effective activity of supervisory authorities, because of the limited number of banks to monitor. Contrarily, Clair (1992), Bofondi and Gobbi (2006) Zhang et al. (2016) and Cincinelli and Piatti (2017) successfully tested the moral hazard deriving from the incentive of managers in banks with large losses of NPLs to take even more risk with the expansion of their portfolio of loans. More precisely, banks with high NPLs ratio might have a short-term benefit by increasing the volume of loans because of the dilution effect in the computation of the NPL ratio. But on the other hand, because of the need to enhance the portfolio growth, new loans are stipulated with less rigorous criteria in terms of credit quality, and consequently in the long-term the bank will probably be affected by a further increase of NPLs.

## DIVERSIFICATION

Diversification, according to the paper “Portfolio Selection” of Markowitz (1952), is expected to lower credit risk through the opportunity of integrating different-correlated investments in the bank portfolio. Hence, diversification should have a negative relationship with the volume of NPLs. Salas and Saurina (2002), Rajan and Dhal (2003) and Hu et al. (2004) used as a proxy for the diversification opportunities the size of the bank and found empirical significance on their test. Differently, Stiroh (2004) and Louzis, Vouldis and Metaxas (2011) tested the assumption using the percentage of the non-interest income over the total income in order to

capture if heterogeneous sources of revenues can represent the diversification effect. However, they eventually reject this hypothesis.

### TOO BIG TO FAIL

The too big to fail hypothesis refers to the moral hazard that big banks might commit in the form of excessive risk-taking because of the expectation of protection from the government in case of failure. In fact, there could exist a misalignment between banks' long-term performances and the remuneration of the managers, who might be encouraged to extend the underwriting of loans also to borrowers with low credit quality. The leverage ratio is in this case used as the proxy because it is a sign of the excessive underwriting of loans. However, the evidence for this hypothesis is mixed. Although Boyd and Gertler (1994) sustain this assumption, Ennis and Malek (2005) do not find sufficient evidence. Finally, Louzis, Vouldis and Metaxas (2011) assert in favour of the positive relationship between leverage and NPL, but only conditional to a certain threshold of size, after which the effect is negligible.

### PROCYCLICAL CREDIT POLICY

The procyclical credit policy assumption is studied on the measurement of the profitability index ROE, the same as the bad management hypothesis, but it oppositely supposes a positive relationship between this indicator and the future amount of NPLs. Rajan (1994) explains in his model that credit policy is not exclusively aimed to maximise the profits of the banks but also to expand, in the short-term, the reputation of the managerial activity. The consequence is that the banks might adopt an excessive credit expansion through the underwriting of loans to low-credit-quality borrowers which could have negative net present values (NPVs) and thus are more likely to generate in the long-term earning losses. Nonetheless, Louzis, Vouldis and Metaxas (2011) and other academics reject this hypothesis of a positive relationship between ROE and future NPLs, as previously mentioned.

### TIGHT CONTROL

This hypothesis was named by Louzis, Vouldis and Metaxas (2011) to demonstrate the relation between ownership structure and the amount of NPLs. The theories concerning this topic are in contrast. Iannotta et al. (2007), building on the theory of Berle and Means (1933), confirm the assumption that there is a negative relationship between the ownership concentration and the levels of NPL, mainly because of the lack of the incentive for shareholders, in case of dispersed ownership structure, to properly monitor the activity of the management. This could eventually lead to weaker performances and to the selection of an inefficient portfolio of loans. In addition, also Shehzad et al. (2010) and Azofra and Santamaria (2011) sustain these results, both asserting that the sharing of control might have a negative on NPLs, while in the case of strong

ownership control evidence suggests better profitability and lower levels of NPLs for the closer monitoring of the managerial activity. On the other hand, some academics sustained the idea of a positive relationship between the two variables. The rationale is explained by Fama (1980) who states that in an efficient capital market ownership dispersed by more investors imposes a stronger discipline on the management because it is more exposed to the influence of the market evaluation. Similar evidence was provided by Laeven and Levine (2009) and Louzis, Vouldis and Metaxas (2011) that associate strong ownership structure with higher levels of risk-taking and NPLs.

### SUPERVISORY ACTIVITY

Several academics measured the effect of on-site audits and supervisory sanctions in relation to the levels of NPLs. The idea is that a closer supervisory activity induces banks to maintain a higher discipline and not to exceed in their risk-taking, especially for high-NPLs banks that could have an incentive to do so. Although Berger and Davies (1998) and DeYoung et al. (2001) argued that on-site audits diminish the excessive risk-taking of imprudent banks, other academics, like Cincinelli and Piatti (2017), do not find enough evidence of the supervisory activity in terms of the effect of sanctions in the case of the Italian banking system.

## CHAPTER 3: THE MANAGEMENT OF NPLs

### BANKING INSTRUMENTS FOR THE MANAGEMENT OF NPLs

Banks can adopt different strategies in order to manage the stock and the flow of NPLs. These policies become significantly relevant especially in the case of highly-affected banks in terms of asset quality that are subjected to substantial drawbacks due to their lack of reliability and to their increased costs for accessing the money market. As reported by Baudino and Yun (2017), the main policies for the management of NPLs are:

- **DEBTOR-FOCUSED POLICIES:** that are aimed to optimise the probability and the value of repayment of the counterparty. They consist of two main different strategies. The first is debt restructuring that is a renegotiation of the debt thought to restore the ability of the borrower to service its commitments. However, this measure entails the opening of a legal process and the consequent rise in the loan loss provisions that could be a deterrent for the adoption of this policy. The second is out-of-court workout which does not require a legal process. It involves the composition of a plan for the debtor to recovering its position but, on the other hand, it could not be effective enough to restore the creditworthiness of the borrower. Nevertheless, both strategies have the limitations of being used mostly for corporate loans and could also have a restrained utility in situations of spread financial distress as in a crisis period.
- **WRITE-OFFS:** that consist of the procedure of the elimination of the NPLs from the balance sheet through the generation of a loss counterbalanced by the reduction of the loan loss provisions. The strategy implies a severe trade-off because of the fact that the incentives of eliminating NPLs, which derives from the incrementation of the market confidence because of a healthier asset side of the balance sheet, may be overcome by the drawback of the decrease in capital and profits. So, especially in the case of banks with low capital buffers and provisioning, banks may have a restrained capability of implementing write-off procedures.
- **DIRECT SALES:** that are the simple practice of selling the NPLs to a counterparty, that could be a bank or, more commonly, a riskier type of financial institution. The most diffused way of selling NPLs is through a package of diversified loans, instead of the individual trade. Nonetheless, its applicability is vulnerable to three main issues. The first is the high-information costs that would be necessary for their evaluation in the case of individual SME NPLs. The second is that the markets in which assets are sold are not too developed and liquid, hence the high transaction costs could create a disincentive for the use of this instrument. Finally, there is a consistent problem of

asymmetric information between buyers and sellers that creates an inherent obstacle to the pricing of these assets. More specifically, the direct consequence is that the bid-ask spread is frequently large, especially during financial crisis, where buyers for the uncertainty circulating in the markets are interested only in heavily discounted assets while at the same time sellers need to maintain the price close to their loans' book values in order to avoid further losses.

- **SECURITISATION:** which is a typology of sale that can attract a wider quantity of buyers. It consists of the procedure of pooling together all the cash flows of a certain group of NPLs and of the creation of a security with three different categories of tranches with different risk-rewarded characteristics, namely senior, mezzanine and subordinate. The buyers can thus benefit from the diversification of the portfolio of loans and also from the opportunity of choosing the preference in their risk exposure. The rationale for banks is similar to the direct sales of NPLs, that is the reduction of uncertainty for their investors due to a safer balance sheet, but it can provide some advantages to the latter method because of the better efficiency, especially concerning small NPLs, where the transactions costs are reduced by the economies of scale when NPLs are packed together. However, securitisation is still affected by the issues of asymmetric information and the market can be not liquid during periods of financial distress.

## GOVERNMENT POLICIES

The role of central intervention to recover from a situation of economic distress is fundamental, especially in regards to market failures in the money market or, more generally, in the financial sector. Thus, governments can have the interest of active intervention in the case of managing high levels of NPLs. Mesnard et al. (2016) and Balgova, Nies and Plekhanov (2016) summarise the main instruments that the central authority has to help the recovering of the banking sector from the burden of NPLs. These policies are reported in the following section.

### ASSET PROTECTION SCHEMES (APSs)

APSs are insurance schemes offered by a state agency in order to guarantee the coverage of a specific amount of potential losses of a bank against the payment of a regular fee. With this insurance, high-NPLs banks can access more easily new credit to fund new loans and prevent the scenario of a credit crunch. Nevertheless, this instrument is, for national interests, typically conceded only to a limited number of large domestic banks and not the entire range of credit institutions, which hence cannot count on this tool. One example of APS was implemented by the UK in 2009 when RBS agreed on an insurance for GBP 282 billion of assets and also in the



US in the same year was launched the Asset Guarantee Program (AGM) in which Citygroup received assistance for USD 301 billion.

#### ASSET MANAGEMENT COMPANIES (AMCs)

AMCs are companies to which are transferred the deteriorated assets of banks. AMCs are firstly aimed to detach the NPLs from the parental entity because of the reduction of investors' uncertainty that cleaned balance sheets entails, and then to manage and recover these deteriorated assets maximising the profit from their value or, where is not possible, minimising their loss. AMCs can either actively manage the NPLs or directly sell them to new buyers, also if the latter option is proved to be more effective. A complex operation of the practice is the evaluation of the transfer price between banks and AMCs that should reflect the real economic value of the assets. That is because on the one hand transfer prices higher than the real economic value can lead to severe losses from the AMCs, while on the other hand lower transfer prices constitute recognition of loss by the bank that affects its capital. AMCs can be both private or public, depending on the interest of the state to intervene. In fact, from a systemic standpoint, AMCs can help to develop the liquidity of the secondary markets of NPLs and also to generate financial stability in periods of economic downturn. Finally, in regards to AMCs, it is useful the implementation of sunset clauses to mitigate the moral hazard created by the incentive of postponing the sale of the deteriorated assets once the economic condition recovers, whereas it is necessary that these entities do not operate for too long. Examples of AMCs in Europe are NAMA in Ireland and SAREB in Spain, respectively established in 2009 and 2012, which both private and public hybrid in terms of property.

#### SECONDARY MARKET OF NPLS

Another important factor for the central authorities is to sustain or enhance the liquidity of the secondary market of NPLs. In fact, this market is particularly affected by imperfections such as asymmetric information and high information and transaction costs. Furthermore, in some countries there is the impediment for non-bank financial institutions to purchase and manage NPLs. Thus, the role of the governments to assist and help the sale of this category of asset. In particular, central authorities should facilitate the investors to access information on borrowers and on collaterals in order to restrict the gap between supply and demand. Moreover, improvements can be obtained by the right to sell NPLs also to non-bank entities and at the same time reinforce the protection for borrowers, especially individual and SMEs ones, as happened in 2015 in Ireland with the introduction of the regulated activity of "credit servicing". In Italy, the implementation in 2016 of GACS ("Garanzia Cartolarizzazione Sofferenze"),



which consists of the guarantee from the state on the senior tranches in the NPL securitisation, acted to enhance the sale of deteriorated assets and also to price them higher.

### SUPERVISORY ACTIVITY

The supervisory activity has a central role in avoiding opportunistic behaviour of the banks and to provide them with clear guidance on the management of NPLs. For example, the Asset Quality Reviews (AQRs) of the ECB are the reaction to neutralise the benefit for banks to postpone loss recognitions that lower their capital through monitoring and inspection in the classification of loans and the value of provisioning. This increases the confidence of the market on banking institutions and on the secondary market of NPLs. In addition, a more stringent supervisory guidance, also in terms of imposing banks to respect quantitative targets as happened in 2013-14 in Ireland, can help to a systemic restore of the level of deteriorated assets.

### INSOLVENCY FRAMEWORKS

Insolvency frameworks are essential to the effective reduction of the levels of NPLs. That is because they can encourage creditors and debtors to a timely restructuring of the deteriorated position. From this perspective, the allowance and promotion out-of-court procedures can accelerate the reduction of NPLs and also can increase the market confidence on these deteriorated assets, which can consequently appreciate. At the same time, the quickening of in-court judicial procedures can provide the same benefits. For instance, in Spain, the reform of the insolvency law in 2014 constituted a positive to avoid liquidations in favour of maturity extensions or of debt-to-equity swaps regarding creditors. Finally, the European states can profit from the harmonisation of these insolvency laws creating a group of common principles and benchmarks.

## CONCLUSIONS

This study examined the main macroeconomic and bank-specific determinants that cause the increase in the level of NPLs. These factors concurred simultaneously after the Global Financial Crisis in 2008 especially in Greece, Cyprus, Portugal and Italy which demonstrated to be the countries that were most affected by this phenomenon. In fact, the empirical research outlined the importance of some macroeconomic factors, like GDP growth, unemployment, interest rates, house prices and sovereign debt, which trigger variations in the aggregate level of NPLs. In addition, circumstances of high volumes of NPLs can also create some incentives for the management of banks to alter their normal behaviour towards banking practice and risk. Thus, academics found significant evidence mainly for the assumptions of bad management, moral hazard and too-big-to-fail hypothesis, respectively proxied by the banks' ROE, solvency ratio and market capitalisation. When all these macroeconomic and bank-specific factors happen simultaneously, the negative effects on the economic output can intensify and lead to situations of credit crunch and severe downfall of the financial markets. To restore confidence and solve market imperfections generated by uncertainty, banks and central authorities have the possibility to implement some instruments that showed consistent potential. Banks can secure their business increasingly adopting strategies of debt restructuring, at least where insolvency laws permit them, and of disposal of NPLs, through the transfer to different entities, like Asset Management companies (AMCs), or through the financial market with direct sales or the use of securitisation. However, the secondary market of NPLs in Europe showed to be not as developed as in the US and, apart from the latest increasing trend in Italy, still insufficiently effective. In fact, the secondary markets of deteriorated assets are highly susceptible to issues of asymmetric information and information costs. In this context, central authorities have an important role in overcoming these market failures. Some effective policies are the implementation of Asset Protection Schemes (APSs) and Asset Management Companies (AMCs), that joined with the increasing supervisory activity and the further optimisation of banking regulations and insolvency laws can significantly help to solve the issue of NPLs.

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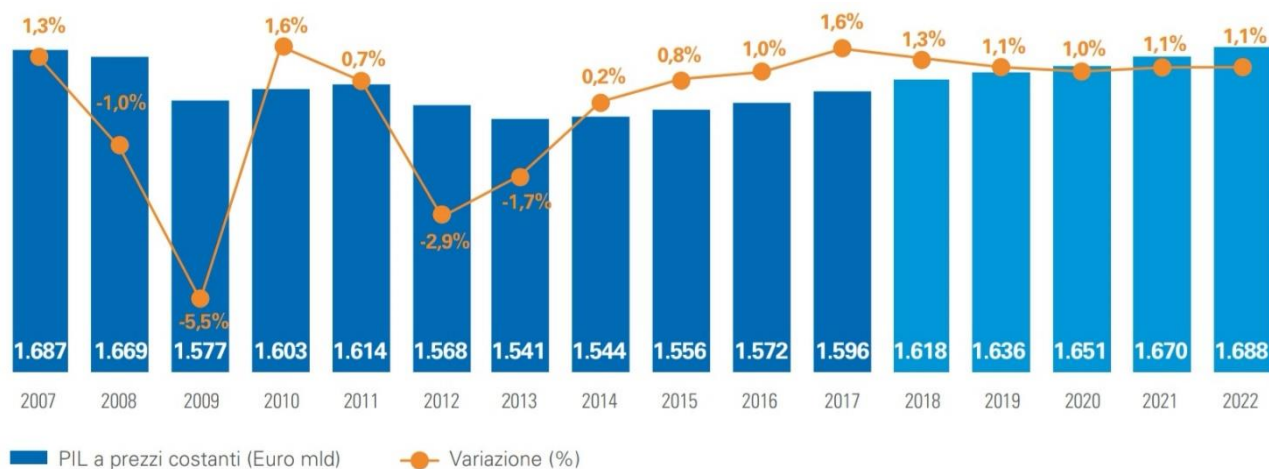
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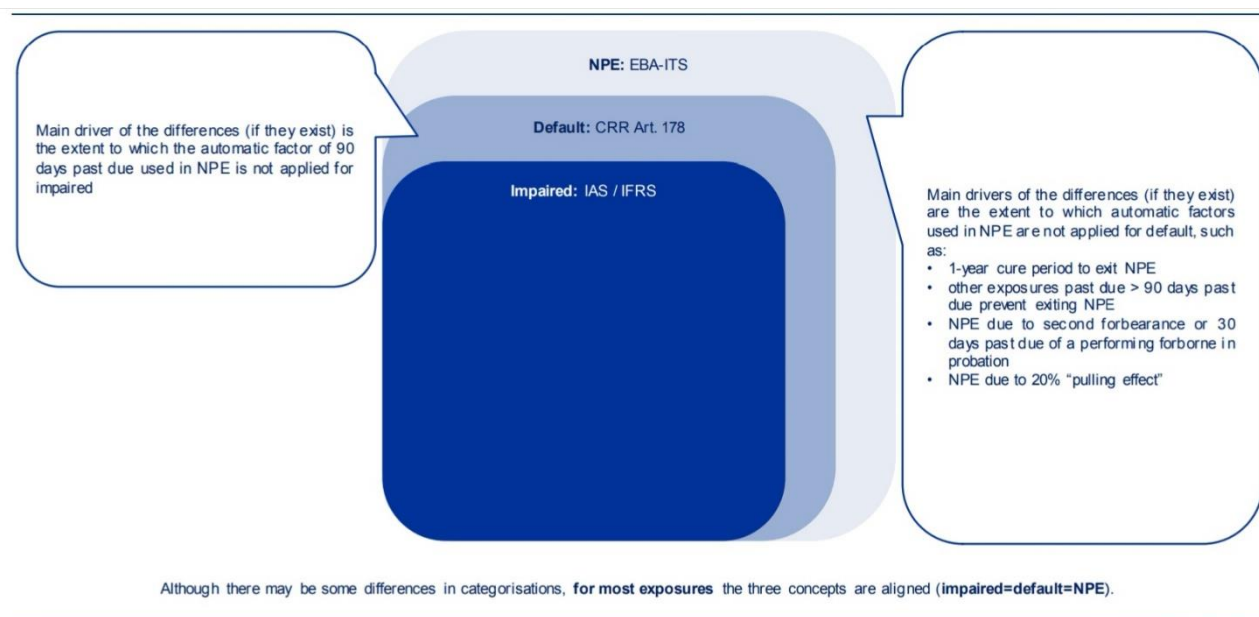
## APPENDICES

### APPENDIX 1- ITALIAN GDP (COSTANT PRICES) SINCE 2007



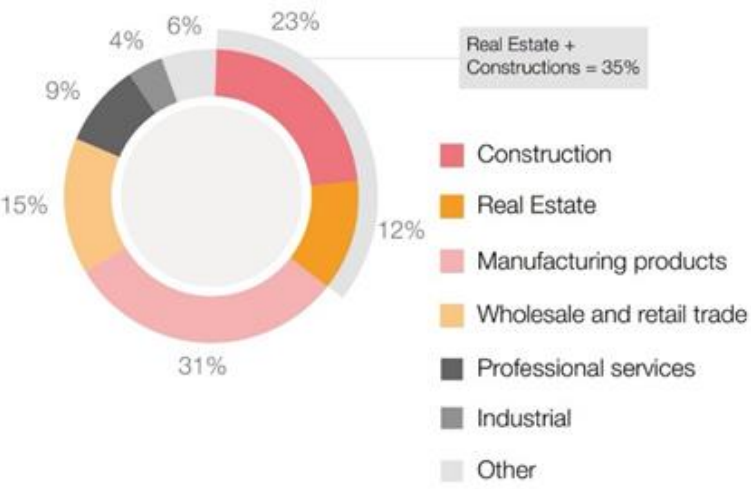
Source: KPMG (2018)

### APPENDIX 2- ILLUSTRATIVE DIFFERENCES BETWEEN NPEs, IMPAIRED, DEFAULTED DEFINITIONS



Source: ECB (2017)

APPENDIX 3- BAD LOANS (“SOFFERENZE”) DISTRIBUTION BY SECTOR (%)



Source: Pwc (2018)