Non-performing loans and the cost of deleveraging: The Italian experience

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Abstract

The massive stock of Non-Performing Loans (NPLs) in Europe has forced regulatory and supervisory authorities to promote debate on their management and timely disposal. Simultaneously, the transition to IFRS 9 created the need for higher provisioning and for weighting sale scenarios in the assessment of NPLs. This study, using a scenario analysis based on the Italian experience of the NPL resolution process, focuses on the cost of deleveraging by comparing the alternative strategies of direct sale and securitization. The study highlights the impact of the assumptions derived from the portfolio assessment and the additional cost arising from the uncertainties surrounding the appropriate recovery procedure. It demonstrates that securitization minimises this cost, while estimating the benefit derived from the support of State-backed guarantees. These findings provide useful insights for policy makers, suggesting the promotion of further measures that aim to reduce the transfer of value from banks to third parties.

Keywords: Non-performing loans; cost of deleveraging; IFRS 9; securitization; strategic management

1. Introduction

European banks have experienced a particularly challenging period over recent years. The Great Financial Crisis (GFC) has highlighted the weakness of the European banking system and the need to further investigate banks' asset quality and transparency from both a regulatory and an accounting perspective. Pressure by different institutions for a more accurate assessment of loan portfolios led to the general need for higher provisioning in a period characterised by extremely low interest rates and low bank profitability. In addition, the persistence and intensity of the GFC has generated a high company death rate, especially for small- and medium-sized firms, which has resulted in an increasing level of Non-Performing Loans (NPLs) on banks' balance sheets. Therefore, since 2007, accounting bodies and prudential regulators have been increasingly focused on the early recognition of credit losses and enhanced disclosure (Bholat et al., 2018).

From a regulatory perspective, the European Banking Union has gradually established new, more severe prudential supervisory rules, especially for credit intermediaries. Since 2014, the European Central Bank, together with national supervisors, has carried out financial health checks of the most significant banks. A comprehensive assessment has been conducted through the Asset Quality Review (AQR) of large European banks, strengthened by stress tests, to ensure adequate capitalisations. The more prudential methodologies used for credit portfolio assessment have revealed a much larger stock of impaired assets than previously disclosed (Aiyar et al., 2015).

To better understand the extent of the sharp deterioration of the banks' asset quality, it is worth noting that the European stock of NPLs reached an historic peak in June 2015, exceeding 1 trillion Euros of gross loans, doubling the value reached in 2009 (Aiyar et al., 2015).[1] This statistic is even more impressive considering that the ratio between the stock of gross bad loans and the total amount of gross loans (NPL ratio) has reached a value of 7.41%,[2] three times higher than that in other global jurisdictions (EBA, 2016a). Moreover, the focus of the Supervisory Authorities on NPL growth pointed out the varying consistency of the problem among EU Countries. NPLs are concentrated along the periphery of the Eurozone, where the financial crisis transformed into a sovereign debt crisis, and the economies have experienced prolonged recession and austerity (Bholat et al., 2018). Among these, Italy has been the most affected, due to the threatening combination of holding the highest stock of NPLs in Europe (210 billion in 2015),[3] and an NPLs ratio of 16.70%, a percentage more than double the European average.[4]

Faced with these numbers and the threat that high NPL stocks may limit the banks' lending ability, impairing the monetary transmission mechanism[5], supervisors have addressed this problem with considerable emphasis. In July 2016, the European Banking Authority (EBA) promoted a debate concerning the

[1] European Central Bank, Statistical Data Warehouse, Total amount of Non-performing Exposures, EU countries participating in the Single Supervisory Mechanism (SSM).
[2] European Central Bank, Statistical Data Warehouse, Non-performing Loans ratio, EU countries participating in the Single Supervisory Mechanism (SSM).
[3] European Central Bank, Statistical Data Warehouse, Total amount of Non-performing Exposures, EU countries participating in the Single Supervisory Mechanism (SSM).
[4] In this comparison at the European level, it is worth remembering that, since 2009, the Irish, German, and Spanish Authorities have set up Asset Management Companies (AMC), also known as 'bad banks', to address banks' growing NPLs, investing over 350 billion €. In the case of Germany, the ownership was entirely public, while other two cases showed about half public and half private ownership (Medina Cas and Peresa, 2016).
[5] EBA argues that "NPLs are a problem at multiple levels: at a micro prudential level, heightened NPLs are associated with lower profitability and lower efficiency; at a macro level high levels of NPLs are associated with stagnant growth as capital is tied up with NPLs and not funding new lending into the real economy" (EBA, 2016b).

importance of the efficient management of NPLs, accompanied by their reduction on the balance sheets of the most exposed banks. In September 2016, the European Central Bank (ECB) released a draft guidance on NPLs, addressed to significant banks directly supervised by the ECB (ECB, 2016), in force since March 2017 (ECB, 2017). These guidelines clarify supervisory expectations regarding the identification, management, and write-off of NPLs in the context of existing regulations, directives, and guidelines. This document stresses the importance of timely provisioning and write-off practices for bad loans. Furthermore, an addendum to the ECB guidelines was released as a draft in October 2017, followed by a final version in March 2018 (ECB, 2018b). The new guidelines aim to reinforce and complete the existing advice by specifying quantitative supervisory expectations concerning the minimum levels of prudential provisions expected for non-performing exposures (i.e. minimum coverage). Additionally, banks are required to follow calendar provisioning, providing full coverage of bad loans after two years for unsecured exposures and after seven years for secured exposures.

Moving on to an accounting perspective, a number of voices at the Bank for International Settlement (BIS), Financial Stability Board (FBS), EBA, and International Monetary Fund (IMF), have expressed concern about delayed recognition of losses on assets (Bholat et al., 2018). This criticism has been directed at the incurred loss approach's ability to reinforce the pro-cyclical effects of bank regulation. Accordingly, standard setters have been called to develop accounting standards that allow for more forward-looking provisioning (Novotny-Farkas, 2016). Consequently, the above-mentioned regulatory pressures on the strategic management of the NPLs coincided with the adoption of the IFRS standards, published in July 2014 and in-force since January 2018. This event has had a forceful impact on banks due to the transition from the Incurred Loss Model (ILM) of IAS 39 to the Expected Loss Model (ELM) of IFRS 9 for loan impairment. Under this new approach, banks are required to accrue provisions based on expected losses rather than on the occurrence of specific events. This requires the adoption of a forward-looking approach which can anticipate losses at the first signals of deterioration (early warning).

An overall assessment of the cost and benefits of the adoption of IFRS 9 is provided by Bischof and Daske (2016), underlining the concerns of the banking industry brought forward during the IASB's due process and concluding that IFRS 9 is the result of a 'political compromise' and thus an 'equilibrium outcome' between the stakeholders of different sectors. The European Systemic Risk Board (2017) underlined that a more timely and forward-looking recognition of credit losses addresses the criticism of the 'too little, too late' provisioning resulting from the ILM. In fact, by expediting loss recognition, IFRS 9 may improve financial stability.[6] Accordingly, Onali and Ginesti (2014) registered the financial markets' generally positive reaction to the announcements of the introduction of IFRS 9 to European listed firms, motivated by the investors' perceptions of the benefits of higher transparency and stronger comparability across accounting standards. However, it is notable that these benefits reduce when the analysis focuses only on financial stocks; in this case, the market reaction is worse than for other industries (Onali and Ginesti, 2015 and Onali et al., 2017). Banks recognize the higher costs generated by the adoption of IFRS 9 when weighed against the perceived benefits. Accordingly, Novotny-Farkas (2016) claims that the new approach can significantly increase the volatility of regulatory capital. Bholat et al. (2018) argue that IFRS 9 changes the relationship between NPLs

[6] Specifically, if the downturn or its implications can be sufficiently identified early on, pro-cyclicality may be reduced and the credit contraction in a downturn may be less severe. Moreover, early loss recognition may also reduce market concerns regarding capital adequacy in a crisis and is typically regarded as positive in terms of enhancing transparency and the effectiveness of market discipline.

and provisions by relying on greater judgement to determine provisions. Suarez and Sanchez Serrano (2018) note that the new approach brings the NPLs' accounting valuation closer to their potential disposal value, thus favouring their disposal. The present article enriches the debate on the costs and benefits of adopting IFRS 9 by examining the cost of the NPL disposal and its sensitivity to the assumptions used in the pricing model. Specifically, the findings highlight that the cost of deleveraging can generate significant losses (i.e. the difference between the net book value and the sell price) that rise with the increasing opacity of this market.

In addition, this study compares the cost of disposal using two alternative strategies, the straight sale of an NPL portfolio to the market and its securitization. Dealing with the strategic management of NPLs, this study builds on the Italian literature concerning: their management (Carpinelli et al., 2016) and evaluation (Ciavoliello et al., 2016); the measures aimed at speeding up the credit recovery (Brodi et al., 2016); and the recovery rates of secured and unsecured bad loans (Ciocchetta et al., 2017; Conti et al., 2018; Fischetto et al., 2018 and Fischetto et al., 2019). This study enhances this stream of literature, providing evidence of the potentially wide difference between the costs of NPL disposal when following the two alternative deleveraging strategies.

Furthermore, this article highlights the benefits of securitization, being the financial tool able to reduce the informational asymmetries between banks and investors and, hence, the wide bid–ask spread characterizing these deals. On this issue, the academic literature is quite limited given that the NPL resolution problem is quite recent. The need to sell portfolios of bad loans was first highlighted by the supervisory authorities in 2016, and the guidelines for their management and the follow-up addendum were issued by the ECB in 2017 and 2018. Fell et al. (2017) provides evidence supporting the use of securitizations based on co-investment between the private and public sector. Bolognesi et al. (2019) show that NPL-backed securities offer an attractive risk-return profile for investors. From the bank's perspective, this study provides evidence of the cost of NPL resolution using securitization under different scenarios. Further, it measures the impact of a public guarantee, covering the senior tranche, on the cost of deleveraging.

This study compares the cost of deleveraging derived from the two alternative strategic options, under several hypotheses, about the recovery procedure and the return demanded by investors. It makes several contributions in the form of policy implications: 1. The results show that in the case of a straight sale of the bad loan portfolio, disposal through securitisation permits a narrowing of the gap between its accounting price and the sell price. This finding suggests there is a need to promote securitization in order to limit the transfer of value from banks to active investors in this market (Ciocchetta et al., 2107) using a methodology available to all banks, irrespective of their size. Policy responses should also be identified to meet the need for an efficient secondary market, currently undeveloped, for the re-trade of the NPL-backed securities issued by securitization. 2. Measuring the impact of a State-backed guarantee on securitization demonstrates that the cost of deleveraging is minimized. This result strengthens the evidence supporting the superiority of securitization, quantifying the positive and significant impact public support exerts on this deleveraging strategy. 3. The findings identify the high variability of the outcomes of both strategies due to the assumptions used in the pricing model and, therefore, the opacity characterizing portfolio assessment. This result offers an estimate of the potential positive impact of both the regulatory measures aimed at speeding up the recovery process, and the improvement in the banks' data quality.

The rest of the paper proceeds as follows: Section 2 focuses on the NPL deleveraging framework, describing NPL strategic management options, their treatment under IFRS 9, and providing some statistics about the Italian NPL resolution process. Section 3 focuses on the methodology and data used in the pricing model to calculate the portfolio's sell price and the related cost of deleveraging. Section 4 presents the empirical findings, followed by the conclusion in section 5.

2. The NPL deleveraging framework

2.1 NPL strategic management

The massive stock of bad loans in Europe has shown the need for supervisory actions: European banks have been invited to develop and implement a strategy for their internal management or disposal. Banks with a high NPL rate have been called upon to reduce these over realistic, but sufficiently ambitious, time-bound horizons (ECB, 2016).

Depending on the size of the bank, the internal workout is generally hampered by high operating costs in setting up an internal unit with management expertise and overall high portfolio fragmentation. Additionally, the management of bad loans is subject to legally mandated timeframes for recovery procedures, likely to be longer than the time scheduled by the supervisory authorities for the deleveraging. Angelini (2018) argues that NPLs are relatively opaque, difficult to value, and, therefore, illiquid. Also, they typically do not yield a steady return; thus, banks with large NPL holdings are less profitable, and pay a risk premium in capital and liquidity markets.

These problems (high loan workout costs and long recovery times) are therefore encouraging banks to push for the sale of their portfolio to third parties, such as professional investors, characterized by a high risk-return profile. The rate of return expected by these investors for the purchase of bad loan portfolios reflects the implicit risk assumed by management of such illiquid assets. Notably, this reward is inflated by the large differences between the excess in supply (many banks are deleveraging at the same time) and the concentration of demand (few active players in this business), which makes NPLs a distressed market. It follows that higher returns result in lower purchase prices being offered to the assignor bank. In addition, the assessment of cash flows by investors is conducted prudentially, overly penalising positions that lack information. Ciavoiello et al. (2016) argue that both the high returns asked by investors and the deduction of the indirect costs from the loan value (which in turn reduces the offer price), are the main drivers of this bid-ask spread. From the shareholders' perspective, this results in a cost arising from the 'safe and prompt' deleveraging strategy taken by the market.

In contrast to direct sale, NPLs can be disposed of through securitisation. This method consists of the sale of the portfolio by the originator bank to a Special Purpose Vehicle (SPV). The SPV is financed by issuing Asset-Backed Securities (ABS) to investors. Depending on the structure details of the operation, ABSs have different ranks of seniority that are repaid through a waterfall scheme that firstly rewards the senior note, then the mezzanine (if issued) and, subordinately, the junior note. It follows that each class of security exhibits different risk profiles and corresponding rates of return, ascending from the senior to the junior notes. In particular, the reward linked to the junior notes will strictly depend on the effective recovery rate of the loan portfolio.

Obviously, securitisation needs a reference market for its implementation: a competitive primary market for the placement of the tranches issued and a secondary market providing the liquidity of the NPL-backed securities. Unfortunately, although the development of a secondary market for these securities has been repeatedly advocated by many parties (Jassaud and Kang, 2015; Enria, 2017; European Council, 2017; Suarez and Sanchez Serrano, 2018), to date it does not exist, therefore obstructing, at least partially, securitisation as a viable strategy for NPL disposal.

Another way to support securitisation could be the search for direct ABS subscribers by the bank; however, the actual implementation of this would be difficult. In particular, the senior tranche, although illiquid, is likely to be placed with institutional investors and favoured by public guarantees. As might be expected, the major problem is the placement of the junior tranche, which is not suitable for all institutional investors due to its risk profile. Alternatively, the direct purchase of the junior notes by the bank's shareholders ('in-house' securitization) would help avoid the transfer of a significant part of the portfolio's value to third parties (Bolognesi et al., 2017). Unfortunately, this possibility is incompatible with the typical bank shareholding structure that consists of several minority shareholders whose investments, for reasons of complexity and illiquidity, must be compliant in terms of suitability and appropriateness.

The implementation of the two strategies presents further obstacles for small banks, due to the market preference towards big portfolios in case of direct sale, and the extent of fixed costs of securitization. It is worth noting that, although not directly covered by the ECB guidelines, small banks have faced supervisory pressures to deleverage under the principle of proportionality. In January 2018, the Bank of Italy released, for less significant Italian banks, a guideline on NPLs, highlighting the expectation of disposal strategies that envisage objectives for the substantial reduction of NPLs, realistic in their quantification and supported by consistent implementation programs (Bank of Italy, 2018). These plans for the NPL resolution, create time constraints that clash with the time needed to search for the best counterpart, to conduct the portfolio audit and accommodate that foreseen by the exclusivity agreement, usually requested by the investor.

Another factor affecting the complexity of the assessment of NPL portfolios, is the risk averse attitude of potential investors, justified by the opacity surrounding the recovery procedure. Banks know their borrowers better than third parties. Thus, investors might assume that the banks sell the worst loans according to a 'cherry-picking' strategy (Ciavoliello et a., 2016). However, a set of additional uncertainties related to the cash flow distribution over the recovery time must be added to these informational asymmetries. Generally, the timing of enforcement proceedings, as well as the assessment of the loans' collateral value, is uncertain due to the dynamics of the real estate market. In terms of collateral, a high level of geographic or sectorial concentration penalizes a portfolio's value. The banks' poor data quality, in terms of completeness, standardization and reliability, is also an issue that is worth addressing as it increases information asymmetries and contributes to depreciation of portfolio value. However, missing data usually leads to severe asset haircuts and, in the worst cases, the zeroing of the loan's value.

A further source of uncertainty in NPL strategic management relates to the expectation for developments in the search for a system-level solution by public Institutions, such as the establishment of a European Asset Management Company (AMC), a type of 'bad bank' set up to collect and manage NPLs at the pan European level. The frequent announcements about the feasibility of these measures (Enria, 2017; Haben and Quagliariello, 2017) have resulted in delays in the banks' deleveraging processes to await further developments. As a consequence, this 'wait and see' strategy raises another type of cost linked to delaying

the decision-making process, which increases the likelihood of market players accepting lower sell prices as this resolution becomes the most feasible option.

Under this framework, the Italian Government has, since 2015, adopted a wide array of legal and regulatory measures aimed at greater efficiency in the strategic management of bad loans. The most impactful measure supporting securitizations is the Italian guarantee scheme (Garanzia Cartolarizzazione delle Sofferenze[7] or GACS). Under this scheme, Italian banks, meeting certain conditions, can request State-backed guarantees on the lower-risk senior notes issued by private securitisation vehicles that help them to finance the sale of their NPL portfolios. In addition, they have implemented other forward-looking measures to improve the Italian legal framework. This includes the so-called 'Marcian Pact' (an agreement under which banks more easily acquire the property owned by a debtor in case of default) and legal procedures aimed at shortening the length and improving the efficacy of credit recovery proceedings (see Marcucci et al., 2015 and Brodi et al., 2016 for a description of the content of the reforms). On these issues, Garrido et al. (2016) claim that further reform actions in the supervisory, legal, and economic areas, are needed to support these measures while Mohaddes et al. (2017) argue that the insolvency reforms, once fully implemented, are only expected to yield benefits gradually over time. As stressed by Giacomelli et al. (2019), the reform wave started in 2015 has substantially reduced the length of foreclosure proceedings, but significant differences across courts suggest additional areas of improvement. Additionally, the authors argue that there is still scope for improved efficiencies focusing on the pre-sale phase of the proceedings. Furthermore, in 2017, the Italian Parliament introduced important innovations for the regulation of securitization with the aim of facilitating the disposal of bad loans, widening the scope for manoeuvring SPVs[8]. These innovations make it easier to securitize the Unlikely-to-Pay (UtP) market and will encourage participation in foreclosure auctions (Albamonte, 2017).

2.2 The NPL accounting treatment under IFRS 9

IFRS 9, which replaced the previous accounting standard for financial instruments (IAS39), was published by the International Accounting Standards Board (IASB) in July 2014, endorsed in the EU in November 2016, and took effect in January 2018. The new accounting standard for the classification and measurement of financial instruments, IFRS 9, established an expected credit loss (ECL) approach to the calculation of impairment allowances. In the aftermath of the global financial crisis, the G20 asked accounting standard-setters worldwide to adopt a more forward-looking approach to provisions for credit risk for instruments measured at amortised cost. IFRS 9 was IASB's response to this call and is compulsory for all listed banks in the EU, as well as for non-listed banks in the majority of EU Member States (Suarez and Sanchez Serrano, 2018).

The EBA welcomed the move to an ECL model and ensured the timely adoption of IFRS 9 in the EU.[9] The Supervisory Authority emphasises that changes in credit loss provisioning will contribute to addressing

[7] GACS was initially approved by the European Commission, under the EU State aid rules, in February 2016 and extended in September 2017, August 2018, and March 2019.
[8] In more detail, SPVs are allowed to grant additional loans to those borrowers whose debts have been sold by banks, so that they may acquire holdings deriving from securitized NPLs through debt-to-equity swaps, and to purchase and manage the immovable (real estate) or other properties placed as the collateral of the securitized NPLs (Albamonte, 2017).
[9] European Financial Reporting Advisory Group (EFRAG).

the G20's concerns regarding the 'too little, too late' recognition of credit losses (EBA, 2018). As specified by the European Systemic Risk Board (ESRB, 2017), the shift from an incurred loss approach to an ECL approach for measuring impairment allowances is the most important change introduced by IFRS 9. The ECL approach applies to all instruments held at amortised cost as well as to all instruments held at fair value through other comprehensive income. Its approach is based on three stages. Stage 1 refers to financial instruments whose credit risk has not significantly increased since initial recognition, and implies recognising ECLs from default events, possible within the next twelve months. Stage 2 refers to non-impaired assets whose credit risk has significantly increased since initial recognition and implies recognising ECLs over the entire residual lifetime of the instrument. Stage 3 refers to assets that are already impaired and involves recognising credit losses on a lifetime basis. Therefore, under the ECL approach, non-performing exposures must be classified as Stage 3, which essentially means that NPLs will still be provisioned according to incurred loss approach dictated by IAS 39.

On this issue, Suarez and Sanchez Serrano (2018) argue that Stage 3 exposures closely match those recognised under the incurred loss model of IAS 39, which requires evidence of impairment for the assignment of provisions. As such, the enforcement of IFRS 9 does not fundamentally modify the criteria for the measurement of impairments on NPLs. Nevertheless, by increasing the impairment losses that will need to be recognised when transferring exposures from Stage 1 to Stage 2, IFRS 9 favours the earlier, and perhaps more decisive, provisioning of NPLs. The authors note that, conceptually, under an ECL paradigm, some credit losses on the NPLs will have been recognised before the loans become non-performing, so the impact on the profit or loss account and on the capital of additional losses, due to recognition of the loans as non-performing, is lower. This leads to earlier and more decisive (conservative) recognition of implied losses, reducing the net carrying amount of the NPLs and, consequently, bringing their accounting valuation closer to the value that might be obtained in a sale or liquidation of the NPL. Consequently, this might reduce banks' incentives to hold onto their NPLs.

Additionally, and even more importantly, the standard requires intermediaries to make provisions for possible sales, thereby reducing the gap between the balance sheet value of assets that they expect to dispose of and the prevailing market prices. This means that under the new impairment framework, the assessment of impaired exposures (Stage 3) must consider the sale scenario, whereas banks foresee the sale on the market as a recovery method. For example, focusing on the largest Italian bank, the '*Report on Transition to 'IFRS 9: Financial Instruments' of UniCredit Group'* describes the methodology used for NPL assessment: the expected recovery value of credit exposures is determined as the weighted average between the internal recovery scenario (assuming an internal workout process) and the sale scenario (assuming the sale of the exposures on the market). To calculate the weighted average, the probability of sale of credit exposures is defined on the basis of the volume of the sales forecasted compared to the total gross exposure of the portfolio being valued. Moreover, the probability of internal recovery is equal to the complement to one of the probability of sale (Unicredit, 2018).

Since the NPL sell prices in the current market are likely to lead to lower (albeit much faster) recovery rates than internal disposal, the incorporation of a sale scenario into the weighted average calculation entails a lower assessment of impaired exposures. Thus, higher provisioning rates are required.

These statements are verified by the first statistics released through the Bank of Italy's report on financial stability. According to the Bank of Italy (2018), in the first half of 2018, the coverage ratio of the non-

performing exposure of Italian banks increased by almost 4 percentage points to 54.3%, which is higher than the average for the main EU banks. More in detail, the coverage ratios of the bad loans and the Unlikely-to-pay have increased by 6.1% (from 61.6% to 67.7%) and by 3.8% (from 33.9% to 37.7%), respectively (Bank of Italy, 2018). The supervisory authority notes that the increase in the ratios have largely been on account of the new IFRS 9 accounting standard that came into force at the start of 2018.

2.3 The Italian NPL resolution process: statistics

The magnitude of the abovementioned supervisory initiatives has resulted in increasing pressure on banks for the rapid and effective disposal of their NPL portfolios, with Italian banks, on the front line, committed to realigning the quality of their credit portfolios to the European average.

In June 2019, the EU stock of NPLs has halved to 616 billion Euros (GBV), and the NPL ratio has reduced to 3.6%.[10] Not surprisingly, this improvement is mostly attributable to the intense activity of the Italian banks, having experienced, in 2017 and 2018, a massive sale of bad loans through an impressive number of transactions, some of these known as 'Jumbo deals' due to their size. [11]

Delving into the deleveraging activity experienced by the Italian banking system, the NPL resolution process started cautiously in 2016, registering an amount of closed bad loans positions of 16.7 billion Euros. An acceleration took place in 2017, with 243 transactions and the total amount of closed positions at 43.4 billion Euros[12]. Among these operations, it is worth noting that 8 'Jumbo deals' occurred, for the disposal of 28.7 billion Euros worth of NPLs. Notably, 12 of these operations (total amount of 20.2% GBV) were supported by the GACS[13].

During 2018, NPLs continued to be disposed of at a swift pace. The total amount of closed positions reached a new peak (€78 billion), 1.8 times higher than what was recorded in 2017. This increase involved both significant and less significant banks, and was almost exclusively driven by disposals, that amounted to approximately €67 billion and were twice the value observed in 2017 (€33 billion)[14]. Disposal portfolios have mainly been mixed between secured and unsecured loans (87%). The high level of concentration is also interesting: through 19 Jumbo deals (4.7% of the total number of deals), 88.4 billion Euros (83.3% of the total GBV) of stock was disposed. Furthermore, 11 out of the 19 Jumbo deals were supported by GACS. [15] If we consider the total number of deals supported by GACS (13), the public guarantee is mainly intended for bigger banks.

Overall, in 2018, 24% of this total amount was disposed of through the market and 49% was supported by GACS.[16] Securitizations were set up using 152 SPVs. The servicer market was also highly concentrated, meaning that only 8 players managed 80% of the GBV. This was motivated by the fact that obtaining GACS

[10] European Central Bank, Statistical Data Warehouse, Total amount of Non-performing Exposures and Non-performing Loans ratio, EU countries participating in the Single Supervisory Mechanism (SSM).
[11] A Jumbo deal is an operation above 1 billion GBV.
[12] Fischetto et al. (2018).
[13] Credit Village (2018).
[14] Fischetto et al., (2019).
[15] Credit Village (2018).
[16] Deals above 10 billion Euros are: Banca Monte Paschi di Siena (24.1); Banca Popolare di Vienza e Veneto Banca (18.0); and Intesa SanPaolo (10.8).

support is tied to the use of servicers with requirements that are met by only a few companies.[17]

Focusing on the sell prices of the NPL portfolios, in 2016 the average price of a transaction was 14.9% (of the GBV). In 2017, the average sell price, excluding the Jumbo deal finalized by Unicredit, was 20.4%, whereas secured portfolios were worth 33.0% and unsecured portfolios were worth 9.2%[18]. The reason for this wide range is due to their characteristics and to the extremely low sell price (13% of GBV) of a specific deal, known as the FINO Project. This operation was the object of an analysis conducted by Rafaniello et al. (2017), aimed at motivating the wide price gap between the FINO sell price and the average recovery rate for all bad loans written off by all Italian banks in the 2014 - 15 period (34.7% of GBV). It is important to note that in this disposal to third party investors, the 'market sale' effect had a strong impact on this price gap of about 12.4%.[19] Moving on to 2018, the average disposal sell price was in line with that of 2017 for positions backed by collateral (33%), and they increased by 2%, to 11%, for the other positions. Loans classified as Unlikely-to-Pay accounted for 5 billion Euros of the total amount of disposals (2 billion Euro in 2017)[20]. In the case of securitization, the weighted average sell price of securitization with GACS was 23.5%: if we exclude the sell price of the Jumbo deal of Banca Monte Paschi di Siena (sell price 18% and issue of 4.3 billion Euros of notes), the average sell price was significantly higher than for the other deals, equalling 29.1%.[21]

Finally, 2018 was also characterized by greater activity from small banks. In particular, the establishment of two Mutual Banking Groups allowed portfolio pooling by the affiliated banks, permitting multi-originator transactions. Similarly, popular banks organized multi-originator disposals, evidenced by two securitizations with GACS: the first aggregated 73 banks, of which 71 were mutual banks; the second pooled 17 banks, of which 12 were popular banks[22].

It is worth highlighting that the deleveraging process, hereafter described numerically, has been accompanied by a general and increasing concern from the banking industry. Proof of this, is the active participation of banks and their Associations in public consultation, launched by ECB in October 2017, on the draft Addendum to the ECB guidance to banks on NPLs. ECB received 35 responses (of which 11 were from Italian banks and institutions) comprising almost 500 individual comments.[23] Among them, some comments accurately summarized the general concern of the sector. Intesa SanPaolo, one of the main Italian banks, commented: 'Any policy measure that would negatively impact capital ratios, such as the forced and rushed liquidation of NPLs, may be counterproductive and may contract new lending to the real economy.[24] The Italian bank also argues that accelerating the NPLs automatic provisioning can have unintended negative

[17] Credit Village (2018).
[18] Fischetto et al. (2018).
[19] The other specific features explaining the price gap are attributable to the fact that the portfolio consists entirely of exposures to firms; their positions are less collateralized and have a higher vintage than average. Furthermore, Unicredit retains an upside in the operation.
[20] Bank of Italy (2019).
[21] Credit Village (2018).
[22] Credit Village (2018).
[23] ECB (2018a).
[24] In particular, 'Because of their pro-cyclicality, the proposed measures of the Addendum – if not amended - would have the following severe consequences on the lending activity since they will: i) favour the credit extension only to highly rated customers (cherry picking); ii) limit the granting of new credit to households and; iii) in particular entail the application by banks of a maximum plafond of unsecured lending to SMEs, due to the extremely punitive capital charge that would emerge on this kind of credit exposures in the case of a unexpected reversal of the credit cycle; iv) lead banks to transfer the higher costs imposed by the ECB's system of provisioning to their clients through a general increase in interest rates paid by relative low rating clients (i.e. households and SMEs)'. (Intesa San Paolo, 2017).

consequences on the functioning of the nascent NPLs' secondary markets because the representation made of NPLs' values in the balance sheets would be clearly misleading. As a consequence, there are concerns that 'the risk is that banks would be indirectly forced to urgently dismiss their NPLs portfolio at some precise dates, which will allow buyers to impose discounted prices on sellers' (Intesa SanPaolo, 2017). The European Council (2017) expressed the same concern, stressing that 'more efforts are needed to restore NPL ratios to sustainable lower levels and that incentives for all EU credit institutions to deal with NPLs pro-actively should be enhanced while at the same avoiding the disruptive effects of fire sales'.

3. Data source and model specification

The cost of deleveraging an NPL portfolio is calculated as the difference between the bank's accounting value (the Net Book Value, NBV) and the sell price. The calculation of these values requires the estimation of several parameters such as the recovery rate (as a percentage of the GBV of the loans portfolio), the distribution of cash flows, and the rate of return asked by potential investors of the entire portfolio (in case of sale) or by the subscribers of the notes, in case of securitization.

The analyses here rely on statistics provided by the ECB and the Bank of Italy. In particular, the recovery rate uses the estimations provided by Ciocchetta et al. (2017) through an analysis based on data from the Italian Central Credit Register and covering the period 2006–2015.[25] Their results over a 10-year period show that the average recovery rate was roughly 43%, with a significant difference between secured and unsecured loans (55% and 36%, respectively), and the lowest value of 26% registered in 2014 for unsecured loans. Accordingly, it is useful to test the identified recovery rates ranging in the [26% - 62%] interval. In addition, the base case is to test a recovery rate of 50%, being the rate calculated when, in 2017, the average coverage ratio of Italian bad loans was 62.3%. The simulation of the cash flow distribution relies on the work of Fell et al. (2017), which presents a recovery process distributed over 10 years (*n'*) where 60% of cash flows are recovered in the first 3 years, 80% by the 5th year, and the rest by the 10th year, on an equal basis. The Internal Rate of Return (IRR) asked by potential investors ranges from 10% to 25%, where 15% is the rate of return likely to prevail in this business.

To calculate the accounting value of a loan, we first focus on its Gross Book Value (GBV). Loans are measured by their amortised cost (according to international accounting standards, IAS-IFRS), meaning that cash flows are discounted at the loan's original effective interest rate. It follows that the GBV of a loan is the sum of the present values of the expected future cash flows:

$$GBV = \sum_{t=1}^{n} \frac{f_t}{(1+i)^t} \qquad (1)$$

[25] The data used in this study relate to delinquent debtors, reported monthly by individual banks and banking and financial institutions belonging to banking groups that participate in the CCR. The universe of closed bad debt positions was surveyed, and between 2006–2015, nearly 2 million positions were closed for a GBV of about €88 billion, just under half of the gross stock of outstanding bad debts at the end of 2015. For each year in the reference period, the recovery rates were calculated at the individual debtor level. The CCR contains data on the losses reported by banks over the lifetime of the position, which include lost revenue from interest payments and other customer penalty charges. The actual amounts recovered are not available and are estimated on the basis of the difference between the gross value of the exposure when it was classified as a bad loan and the accumulated losses—including partial write-off made before the closure (Ciocchetta et al., 2017).

where f_t is the cash flow at time t; n is the number of cash flows and i is the original effective interest rate (These analyses use an average borrowers' rate of 4%).[26]

Focusing on the NPLs, banks use the same methodology, but they modify the cash flows to take the probability of the borrower's default, the recoverable amount of the loan, and the new recovery time into account. Thus, the accounting value (NBV) of the bad loan portfolio is:

$$NBV = \sum_{t=1}^{n'} \frac{f'_t}{(1+i)^t} \quad (2)$$

where f'_t is the new cash flow at time t and n' is the new recovery time. The recovery rate is, therefore, the sum of cash flows (f'_t) as a percentage of the GBV, making the difference between GBV and NBV the sum of the loan loss provisions gradually accounted by the bank.

The calculation methodology for the estimation of the sell price of the portfolio is rather different in the case of direct sale and securitisation. For the direct sale strategy, the value of the loan portfolio is calculated by the investor's assessment of the amount and the timing of the cash flows generated by the recovery procedure, net of the servicing costs, and considering a target return on the investment. Thus, the sell price in case of direct sale ($Price_{DS}$) is calculated as follows:

$$Price_{DS} = \sum_{t=1}^{n''} \frac{f''_t * (1-c)}{(1+IRR)^t} \quad (3)$$

where f''_t is the cash flow estimated by the investor at time t, n'' is the related recovery time, c is the servicing cost (as a percentage of the estimated cash flow), and IRR is the Internal Rate of Return.[27] Servicing costs are 8% of the expected cash flows, in line with the estimation of Quaestio Capital Management (2016). Therefore, the cost of the direct sale (Cost of Sale) is expressed by a bid-ask spread where the bid price is the sell price of the portfolio, and the ask price is its accounting value (NBV):

$$Cost\ of\ Sale = \sum_{t=1}^{n''} \frac{f''_t * (1-c)}{(1+IRR)^t} - \sum_{t=1}^{n'} \frac{f'_t}{(1+i)^t} \quad (4)$$

For the securitisation strategy, the sell price of the bad loan portfolio depends on the overall structure of the operation. Operationally, the SPV issues Asset-Backed Securities (ABS), which can be senior, mezzanine, or junior tranches, but must be placed on investors. These notes are characterized by different risk profiles, meaning that the SPV buys the bad loan portfolio from the originator at the agreed price ($Price_{SEC}$). In this scheme, cash flows generated from the recovery procedure follow a waterfall flow, designed so that payments are addressed to cover: the operating costs of the SPV and the Servicer; the interests of the senior; the interests of the mezzanine; the principal of the senior; the principal of the mezzanine, and, on a residual basis, the nominal value and an interest premium of the junior note.

[26] This rate is in line with the estimations provided by Prometeia (from 4.0% to 4.5%) and BNP Paribas (from 3.1% to 4.5%).
[27] Generally, fixed servicing costs are also provided.

Determining the cost of this strategy involved designing a first securitisation, characterised by the same assumptions as the direct sale, including recovery rate ranges between [26%–62%], servicing fees of 8% of the cash flows, and time to recovery of 10 years.[28] To set up a securitisation with a sustainable structure, but based on conservative hypotheses, assume that the SPV issues two types of ABS, a senior and a junior tranche, with face values of 75% and 25% of the portfolio, respectively. An annual coupon interest rate of 2% is assigned to the senior tranche.[29] For junior tranche subscribers, the same expected IRR was tested for direct sale (from 10% to 25%). In this model, the waterfall scheme provides that cash flows are used firstly to pay the servicer and then the coupon to the senior subscribers and any excess amount reduces the Senior outstanding note. Once the principal of the Senior note is fully repaid, the cash flows start to repay the Junior subscribers.

In addition, a second operation was designed to test the impact of the State-backed guarantee (securitisation with guarantee) on the cost of deleveraging. Since the structure of the operations that has been implemented since 2016 is rather similar, the method presented here focuses on the design of the first securitisation supported by GACS, which can be considered representative.[30] Hence, for this model, it is safe to assume that the SPV issues 3 classes of notes: 1) a senior investment grade tranche (84% of the total issue) with a coupon of 3mEuribor + 0.5% and rated by Moody's and Deutsche Bank Rating Service (DBRS) as BBB(high)/Baa1; 2) a mezzanine tranche (10% of the total issue) with a coupon of 3mEuribor +6% rated by Moody's and DBRS as B(high)/B2; 3), and a junior tranche (6% of the total issue) with a coupon of 3mEuribor +15%.[31] This setup supports the hypothesis that the reward demanded by investors acting in the NPL market is comparable, at around 15%. The cost of the public guarantee is market-based and refers to a basket of Credit Default Swaps showing the same rating as the senior note that increases according to the recovery time of the underlying assets. The model assumes the cost of the guarantee of 1% (calculated on the outstanding principal of the senior note) and 3mEuribor of 0%.[32] In this case, the waterfall scheme provides that cash flows are used, firstly to pay the servicer, the cost of the guarantee and the coupon to both the senior and mezzanine subscribers, where after the excess amount reduces the senior outstanding note. Once the principal of the Senior note is fully repaid, repayment of the principal of the Mezzanine note commences, and likewise only when this note is fully repaid will the cash flows start to repay the Junior subscribers.

The next step is to calculate the sell price and the related cost of deleveraging (both as a percentage of the GBV), following a scenario analysis. This includes the presentation of four scenarios based on different hypotheses about the parameters that enter the pricing model aimed to test the impact of the different evaluations of the recovery process outcomes. The first two scenarios assume that the evaluations concerning the recovery rate, the time to recovery, and the distribution of the cash flows are aligned between the bank and the investor. To the contrary, the third and fourth scenarios assume that investors estimate the parameters

[28] This study did not consider other type of costs, i.e. fixed costs of setting up the SPV.
[29] This rate is rather conservative as it reflects neither the use of guarantees nor the presence of a rating for the senior tranche.
[30] We base the analysis on the securitization implemented by Banca Popolare di Bari in 2016.
[31] The pre-enforcement waterfall allowed for interest on the mezzanine to be paid to the repayment of the principal of the senior note.
[32] The average 3yr CDS of the BBB Italian basket in January 2017 was 91 bps. In December 2018, this value reached a maximum of 150 bps due to increased sovereign risk (source: Bloomberg). Here, the value is set to 100 bps to avoid considering the volatility of the Italian political risk.

more prudentially due to the information asymmetries and the intrinsic opacity governing a recovery procedure.

The first scenario, the *base case*, relies on a time to recovery distributed over 10 years. Recalling equations (2) and (3), in this case, $n'=n''$=10yrs. The expected cash flows from the bank and investor side coincide ($\Sigma f'_t=\Sigma f''_t$) and the recovery rate ranges in the interval [26%–62%].

The second scenario is aimed at verifying the impact of a time to recovery 2 years longer than the base case scenario. Consequently, the pricing model is considered to have the same hypotheses as the base case scenario, but with a recovery distribution of cash flows over 12-years ($n'=n''$=12yrs). This scenario is named *12-yr time to recovery*.

The third scenario is aimed at testing the sensitivity of the sell price against a more conservative portfolio assessment by investors. This scenario is called the *5% lower recovery rate* because it assumes a discrepancy between the banks' and investors' estimation of the recovery ratio of 5%:

$$\sum_{t=1}^{n} \frac{f'_t - f''_t}{GBV} = 5\% \qquad (5)$$

Finally, the fourth scenario, in addition to a 5% gap in the recovery rate, also assumes a misalignment in the cash flow distribution evaluation, over 10 years by the bank and over 12 years by the investors. This is the *worst-case scenario* because the cost of deleveraging is affected by the misalignment in the evaluation of both the recovery rate and the time to recovery.

4. Empirical findings

4.1 Scenario analysis

Scenario 1: 10-yrs time to recovery (base case)

Table 1 reports the portfolio sell price and its cost of deleveraging in the *base case scenario* that has a recovery process lasting 10 years. Different recovery rates, from 26% to 62%, depending on the type of portfolio (unsecured *vs* secured), and different figures for IRR, from 10% to 25%, are considered depending on the return asked by the investors. In the case of direct sale, the sell price ranges between 11.9% and 37.6%, and the cost of deleveraging is between 3.8% and 18.5% of the GBV. Focusing on the case of a mixed portfolio (recovery rate of 50%) and an IRR of 15%, the sell price is of 27.4% and the cost of deleveraging is 10.3%.

- Insert Table 1 about here -

In the case of securitization, the pricing model is based on the condition that the expected IRR for the junior note subscribers is in the 10%–25% interval, coherent with the assumptions of the direct sale strategy. The sell price ranges between 15.4% and 46.1% and the deleveraging cost is between 0.2% and 10.2%. Focusing on an expected IRR of 15% and a recovery rate of 50%, the sell price is 34.2% of the GBV, corresponding to a cost of deleveraging of 3.5%.

The securitisation with the guarantee provides a sell price ranging between 20.0% and 47.6% of GBV considering unsecured and secured loans, respectively. In this case, sell prices are lower than the

corresponding NBV, and in accordance with the decree of GACS,[33] the sell price must be set to equal the accounting value. Consequently, the cost of deleveraging, is null. Otherwise, the cost of deleveraging would be negative (from -0.4% to -0.8%) meaning that the average interest rates paid to the noteholders is, on average, lower than 4%, which is the borrowers' rate used in the NBV calculation.

Scenario 2: 12-yrs time to recovery

The pricing model of the second scenario is based on a recovery process distributed over 12 years instead of 10. A longer recovery process means a lower present value of cash flows and, therefore, lower sell prices. As shown in Table 2, in the case of direct sale, the sell price ranges between 9.7% and 30.8%, resulting in a cost of deleveraging that ranges between 6.7% and 23.8%. In the case of securitization, the sell price ranges between 13.4% and 43.4% and the cost of deleveraging is in the range of [1.4%–14.8%]. When the guarantee is provided, the sell price rises in the range of [19.0%–45.2%] and the cost of deleveraging is between 0.6% and 1.6%. Focusing on the 15% IRR and the 50% recovery rate, the cost of deleveraging decreases from 15.3% in the case of direct sale, to 6.3% in case of securitization, and to 1.3% in case of securitization with GACS.

- Insert Table 2 about here -

Scenario 3: 5% lower recovery rate scenario

This scenario is based on the event, quite common, of the misalignment between the investors' and the bank' expectations, resulting in a more conservative investors' assessment of the portfolio in terms of recovery rate. A gap of 5% is assumed in the recovery rate evaluation between banks and investors. Table 3 shows the results. In case of direct sale, the sell price ranges between 9.6% and 34.6% of the GBV. Consequently, the cost of deleveraging ranges in the interval of [6.9%–20.8%]. In case of securitization the sell price rises in the range of [12.4%–42.4%], providing a cost of deleveraging in the range of [4.0%–13.1%]. The securitization with GACS allows even higher sell prices, in the range of [16.1% - 43.8%], and a cost of deleveraging between 3.5% and 3.0%. When the IRR is 15% and the expected recovery rate by the investor is 45% (corresponding to the assumption of 50% by the bank), the cost of direct sale, securitization, and guaranteed securitization is 13.0%, 6.9%, and 3.1%, respectively.

- Insert Table 3 about here -

Scenario 4: worst-case scenario (misalignment in the recovery rate and in the time to recovery)

The last scenario is the most penalizing for the bank because the time to recovery is 2-years longer than that assumed by the bank and which is added to a 5% gap in the recovery rate evaluation (as in *scenario 3*). Table 4 shows sell prices in the range of [7.8%–28.4%] in case of direct sale; in the range of [10.8%–39.9%] in case of securitization, and in the range of [15.7%–42.5%] for a guaranteed securitization. This results in the cost of deleveraging rising from a minimum of 4.3%, in the case of securitization with GACS, to a maximum of 25.6% for direct sale. Focusing on the case of a 15% IRR and a 50% recovery rate, the cost of

[33] Decreto Legge n. 18, 14th February 2016 states that loans must be transferred to the SPV for an amount not exceeding their NBV.

deleveraging is 17.6% in the case of direct sale, 9.5% in case of securitization, and 4.5% when the guarantee is provided.

- Insert Table 4 about here -

4.2 Comparison between direct sale and securitization

To compare the cost of deleveraging arising from the alternative options of direct sale and securitization, this analysis uses an investor's return of 15%. Figure 1 shows the incremental average cost of deleveraging, using alternative strategies in the different scenarios. In particular, the graph shows the additional cost of securitisation and direct sale with respect to securitisation supported by the government guarantee. For example, focusing on the *base case scenario*, the cost of securitization with GACS is null; the cost of implementing securitization is 3.2% and the additional cost of direct sale is 6.4% (meaning a total cost of 9.6%). The maximum difference between the cost of direct sale and securitisation with GACS is 12.8% under the second scenario. It is also worth noting that the cost of deleveraging rises more when the time to recovery is lengthened by 2 years (*scenario 2*), and assuming a 5% discrepancy in the recovery rate (*scenario 3*).

- Insert Figure 1 about here –

These results show the significant difference in the cost of bad loan disposal resulting in different levels of the banks' capital erosion. These findings thus demonstrate the superiority of securitization with respect to direct sale, quantifying the transfer of resources between the bank's shareholders and third parties, dependent on the mix of the bad loans held by the bank. It is also worth noting that the cost of deleveraging, in the case of securitization, is influenced by the assumption of extremely low interest rates in the Eurozone. This means that increasing interest rates may significantly alter these results.

4.3 Sensitivity analyses

To determine the impact of the noted assumptions on the cost of deleveraging, this study relies on three sensitivity analyses. The first is aimed at observing the variability of the cost of direct sale and securitization (without guarantees) when the independent variable is the portfolio's expected recovery rate. Figure 2 illustrates this by demonstrating the variability of the outcomes when considering the six portfolio collateral types.

In the case of direct sale (Figure 2a), for unsecured portfolios (recovery rate=26%), the cost of deleveraging ranges between 3.8% (where IRR=10% under the *base case scenario*) and 11.8% (where IRR=25% under the *worst-case scenario*). The body of the candlestick figure represents the average cost when the IRR is 20% (the top, 8.9%) and when the IRR is 15% (the bottom, 7.9%). The variability of the cost of direct sale increases with collateral. At a recovery rate of 62%, the cost fluctuates in the wide range between 9.2% and 25.6%.

In the case of securitization (Figure 2b) the cost of deleveraging, as well as its variability, is lower. Focusing on unsecured portfolios, the cost of securitization ranges between a minimum of 2.6% (assuming IRR=10%), 4.2% when the IRR is 15% (bottom of the candle body), 5.5% when the IRR is 20% (top of the candle body), and a maximum of 6.6% (when IRR=25%).

- Insert Figure 2 about here -

The second sensitivity analysis focuses on the variability of the additional cost of the direct sale with respect to securitization in each scenario. Figure 3 presents the results. Regarding *scenario 1*, this gap ranges between a minimum of 3.5% (recovery rate=26% and IRR=25%) and a maximum of 8.5% (recovery rate=62% and IRR=10%). The body of the candlestick figure represents the average extra cost when the recovery rate is 55% (the top 7.5%) and when it is 36% (the bottom 5.2%). The maximum variability of this gap is associated with *scenario 2*, based on a 2-yr slower recovery procedure - in this case the extra cost is between 3.7% and 12.6%. These results explain the huge variability in the results, dependent on the assumptions used in the pricing model.

- Insert Figure 3 about here -

Finally, we focus on the impact on the deleveraging cost of more conservative assumptions deriving from a portfolio assessment different to the banks'. In particular, we focus on the variability of the difference between the results in the four scenarios with respect to the figures registered in the *base case scenario*. This difference represents the cost of uncertainty of the recovery procedure. Figure 4 details the sensitivity of the cost of uncertainty with respect to the assumptions applied to the pricing model, in terms of IRR and recovery rate. For example, the extra cost of assuming a cash flow distribution 2-years longer (*scenario 2*), ranges between 2.2% (for unsecured portfolios and IRR=25%) and 6.8% (for secured portfolios and IRR=10%). In the graph, the body of the candlestick figure represents the average cost of uncertainty in the case of a recovery rate ranging from 36% (the bottom, 3.6%) to 55% (the top, 5.3%). Predictably, the highest cost is registered under the *worst-case scenario* where the distribution is set at 12-years and the recovery rate estimation at 5% lower. In this case, the cost of uncertainty ranges from 4.1% to 9.2%.

- Insert Figure 4 about here –

4.4 Limitations of the study

Although our analysis considers multiple scenarios in terms of recovery ratio and recovery times, it is necessary to emphasize that the cost of deleveraging is also influenced by the prevailing market conditions during the disposal. Specifically, in the case of securitization, the expected returns of the NPL-backed securities are commonly linked to the Euribor interest rate, meaning lower sell prices with increasing interest rates. A second variable is the cost of the GACS, being a market-based guarantee and linked to the interest rate dynamics, together with the country risk of the issuer, the latter being subject to political risk at the time of the disposal.

Furthermore, regarding the effective implementation of securitization, there are three noteworthy problems in following this strategy. The first concerns the feasibility of securitization for smaller credit institutions. Their access to securitization is precluded, except through multi-originator operations built in recent years by mutual banks due to their reorganization into national banking groups. The second problem is that the GACS is not a structural measure; it has recently been renewed three times and there is no certainty

around future renewals. Finally, securitization requires a developed secondary market for NPL-backed securities provide liquidity. The development of this market is desirable, both from the investors' side, because these securities offer an attractive risk–return profile (being uncorrelated with the most traditional asset class, in a context of low interest rates), and from the banks' side, considering that NPL disposals will no longer be sporadic but continuing events in the future.

5. Discussion and conclusion

The scale and persistence of the financial crisis, which has been particularly severe for Small and Medium Enterprises (SMEs), has led to a widespread decline in the quality of credit portfolios. The abnormal stock of NPLs held by most South-European banks has highlighted the limits of standard internal recovery procedures, predominantly the high recovery time, as incompatible with the Supervisors' expectations of a rapid decrease of the NPL stock. Unfortunately, banks must face the problem of deleveraging in a period characterised by low profitability, weak real estate markets, and a prolonged financial crisis. Moreover, the capital requirements, increasingly severe in the light of the Supervisory Review and Evaluation Process (SREP), make this issue even more delicate, and the cost of deleveraging extremely important considering that markets, as witnessed in Europe, tend to penalize bank recapitalization after a period of strong demand for increases in their capital.

In addition, the commitment to reduce impaired loans overlaps with the application, since January 2018, of the accounting standard IFRS 9, leading to a tightening in the valuation of impaired loans. Under the new approach, the forward-looking provision is governed by a three-stage model. Where a significant increase in credit risk is deemed to have occurred, the amount provided increases whereby losses expected from events over the lifetime of a loan are provided for, and the loan moves from Stage 1 to Stage 2. When the loan becomes credit-impaired, it moves to Stage 3 and must be evaluated against the probability of the market sale scenario. The increase in the coverage ratios in the first year of introduction of the accounting principle is proof of this. Accounting values closer to their potential sell price will shorten sales in the near future because the bid-ask spread will be significantly reduced and, therefore, the feasibility of these deals increased. Another trend is the sale of Unlikely-to-Pay loans, which will also feed this market. Future studies should analyse the impact of this new accounting principle in the strategic management of NPLs.

This study analysed the cost of deleveraging under the alternative strategies of direct sale and securitisation. The first strategy is hampered by the high returns expected by investors active in this business, based on the interplay between fast resolution and the complete transfer of the risks to third parties. The cost of deleveraging is extremely high, but this provides a safe resolution from both the bank and supervisors' perspectives. On this issue, Angelini (2018) argues that sale to the market is, *de facto,* the only way to affect the rapid reduction of bad loans. These sales typically take place at prices that are much lower than the book value, causing a loss that more than offsets any positive effects on capital ratios. Thus, the author claims that sales of NPLs, rather than NPL stocks, could weaken the supply of credit.

Regarding securitization, these results demonstrate that this strategy leads to a lower transfer of value from the bank's shareholders to third parties, with a significant saving on resources. By including the support of public guarantees, the advantages associated with the securitisation approach are amplified. The GACS was approved by the Italian parliament in 2016 to tackle their threatening NPL problem. A similar scheme

named ‘Hercules’ was designed by the Greek Government and approved by the European Commission in October 2019 (European Commission, 2019). In December 2019, the ECB released an opinion on this guarantee scheme, emphasizing the importance of dealing with NPLs in an ‘efficient and effective manner’ (ECB, 2019). More specifically, the supervisory authority argues that risk transfer through asset sales, securitisation, and other measures is an important part of the toolkit available to credit institutions to effectively reduce NPLs. With Hercules being an Italian GACS-based guarantee, these findings on the cost of deleveraging could provide valid support for Greek banks that are approaching this deleveraging strategy. Further, because these analyses are based on a wide range of recovery rates that can easily fit other financial systems, the findings related to securitization without GACS can be generalized across European banks.

These findings are highly sensitive to the assumptions used in the pricing model: the effect of the costs of direct sale and securitization on the return asked by investors and the distribution of cash flows increases when moving from unsecured to secured portfolios. Additionally, the study illustrates the variability of the extra cost of direct sale over securitization in each scenario considered. Finally, the study analyses the additional cost of information uncertainty, deriving from the opacity surrounding the assessment of an NPL’s portfolio (i.e. inefficient and costly recovery processes, judicial capacity constraints, difficulty in assessing the collateral, poor-quality data, and so on). Uncertainty increases the risk perceived by potential investors, impacting negatively the price offered to the bank and resulting in a significantly higher deviation from the book value.

These findings are useful for banks managers, offering evidence of the deleveraging cost under different scenarios and alternative strategies. Moreover, the analyses provide evidence of the cost of informational asymmetries, highlighting the importance of the commitment required of banks (aimed at more effective due diligence) to improve the data quality of loan portfolios. These results also provide useful insights for regulators and policy makers, into ways of increasing the efficacy of the tools available for the management of NPLs, currently characterized by opacity, inefficiencies, and tight time constraints.

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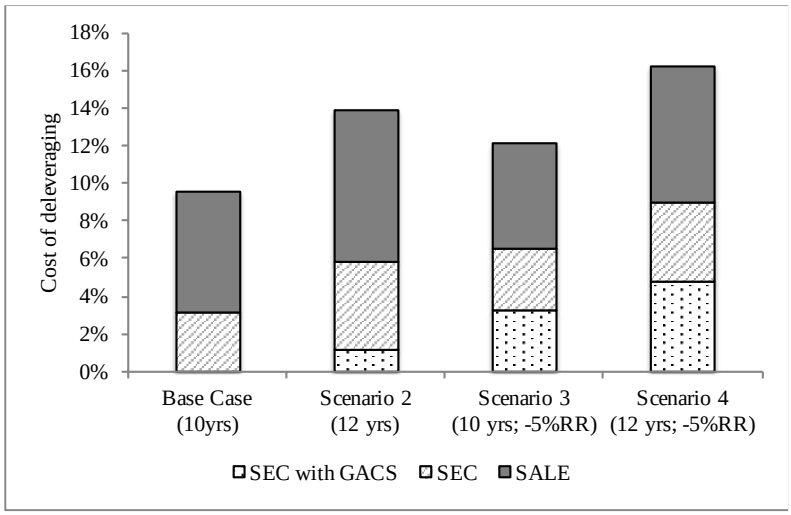
FIGURES

Figure 1

Cost of deleveraging

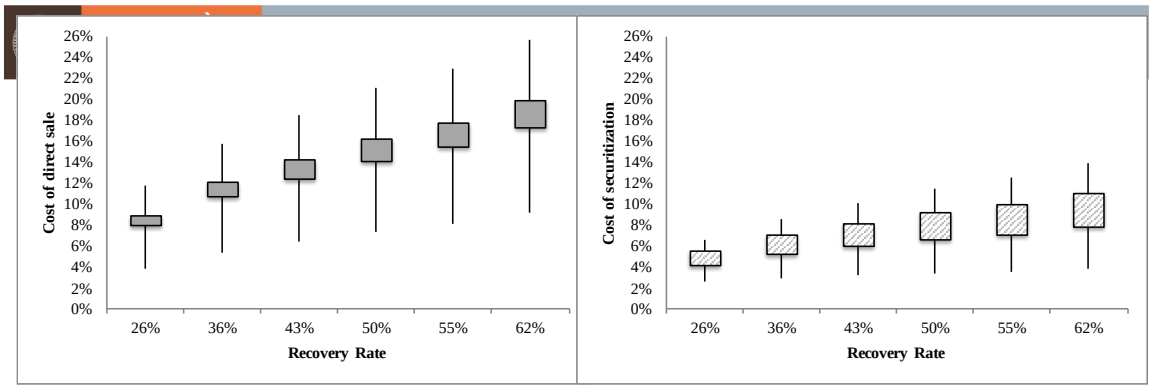


The graph shows the incremental cost of direct sale and securitisation with respect to securitisation with the guarantee. IRR is set equal to 15%. The *base case scenario* assumes a recovery procedure lasting 10 years and distributed as follows: 60% of cash flows in the first 3 years, 80% by the 5th year and the rest, on an equal basis, by the 10th year; *scenario 2* (*12-yrs time to recovery*) assumes a recovery spread over 12 years where the cash flows, in terms of amounts (and time), are the following: 45% of cash flows in the first 3 years, 65% by the 5th year; 70% by the 6th year and the rest, on equal basis, by the 12th year; *scenario 3* (*5% lower recovery rate)* follows the 10-years distribution and assumes a discrepancy of 5% in the recovery rate evaluation between banks and investors; *scenario 4* (*worst case scenario*) follows the 12-year cash flow distribution and assumes 5% discrepancy in the recovery rate evaluation.

Figure 2

Sensitivity analysis: cost of deleveraging

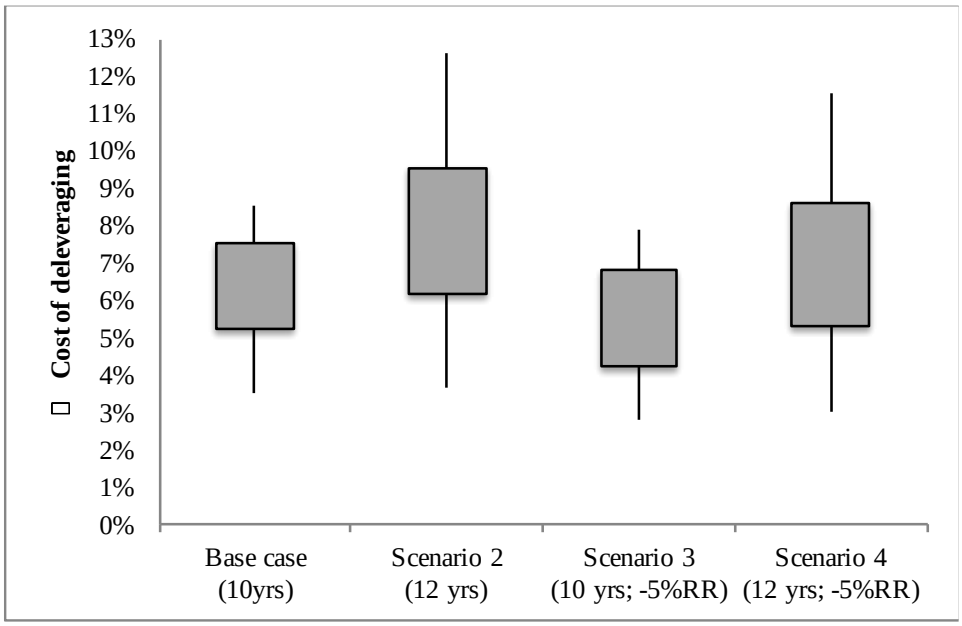
a) b)



This figure shows the variability of deleveraging cost in case of direct sale (graph a) and of securitization (graph b). The analysis is based on the type of portfolio (from unsecured to secured portfolio associated to a expected recovery rate ranging from 26% and 62%, respectively). Each candlestick represents the sensitivity of the cost of deleveraging in the different hypotheses of IRR (from 10% to 25%), time to recovery (10 or 12 years) and a 5% discrepancy in the recovery rate evaluation. The maximum and minimum value of the candlestick represent the average cost of deleveraging in case of IRR equal to 25% and 10%, respectively. The body of the candlesticks represents the average cost of deleveraging in case of IRR equal to 20% (the top) and of 15% (the bottom).

Figure 3

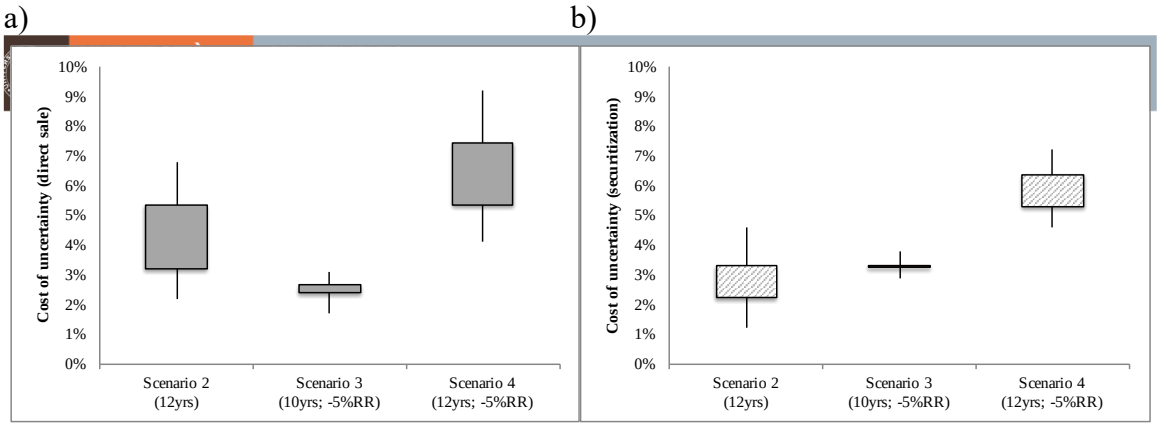
Sensitivity analysis: △ cost of deleveraging



This figure shows the variability of the difference between the cost of direct sale and securitisation in each scenarios (△ cost of deleveraging). The *base case scenario* assumes a recovery procedure lasting 10 years and distributed as follows: 60% of cash flows in the first 3 years, 80% by the 5th year and the rest, on an equal basis, by the 10th year; *scenario 2* (1*2-yrs time to recovery*) assumes a recovery spread over 12 years where the cash flows, in terms of amounts (and time), are the following: 45% of cash flows in the first 3 years, 65% by the 5th year; 70% by the 6th year and the rest, on an equal basis, by the 12th year; *scenario 3* (*5% lower recovery rate)* follows the 10-years distribution and assumes a discrepancy of 5% in the recovery rate evaluation is set between the bank and the investor; *scenario 4* (*worst case scenario*) follows the 12-year cash flow distribution and assumes 5% discrepancy in the recovery rate evaluation. Each candlestick shows the extra cost of direct sale: the minimum is associated to a recovery rate equal to 21% and the maximum equal to 57%; the body of the candlestick represents the average extra cost in case of recovery rate equal to 50% (the top) and in case of recovery rate equal to 31% (the bottom).

Figure 4

Sensitivity analysis: cost of informational uncertainty



This figure shows the variability of additional deleveraging cost arising from the informational uncertainty surrounding the recovery procedure and of the return ask by investors. This cost is calculated as the difference between the results related to each scenario with respect to the *base case scenario*. The outcomes are based on assumptions about the IRR (from 10% to 25%) and the recovery rate (from 26% to 62%). The *base case scenario* assumes a recovery procedure lasting 10 years and is distributed as follows: 60% of cash flows in the first 3 years, 80% by the 5th year and the rest, on an equal basis, by the 10th year; *scenario 2* (*12-yrs time to recovery*) assumes a recovery spread over 12 years where the cash flows, in terms of amounts (and time), are the following: 45% of cash flows in the first 3 years, 65% by the 5th year; 70% by the 6th year and the rest, on an equal basis, by the 12th year; *scenario 3* (*5% lower recovery rate)* follows the 10-years distribution and assumes a discrepancy of 5% in the recovery rate evaluation between banks and investors; *scenario 4* (*worst case scenario*) follows the 12-year cash flow distribution and 5% discrepancy in the recovery rate evaluation. Each candlestick shows the variability of the cost of informational uncertainty under each scenario: the body of the candlestick represents the average cost in case of IRR equal to 55% (the top) and to 36% (the bottom).

TABLES

Table 1

Sell price and cost of deleveraging: *base case scenario*

This table reports the sell price of the NPLs portfolio and its cost of deleveraging under our *base case scenario*. This case assumes a recovery procedure lasting 10 years and distributed as follows: 60% of cash flows in the first 3 years, 80% by the 5th year and the rest, on equal basis, by the 10th year. We assume 6 expected recovery rates (RR): following the findings of Ciocchetta et al. (2016), 26% is the lowest average recovery rate recorded in 2014 for unsecured loans; 36% is the average recovery rate of unsecured loans during the 2006-15 period; 43% is the average recovery rate during the 2006-15 period; 55% is the average recovery rate of secured loans during the 2006-15 period; 62% is the highest RR of secured loans recorded in 2006. We add the 50% recovery rate, calculated considering the Italian average NBV of bad loans (37.7%). We consider four levels of IRR demanded by potential investors, from 10% to 25%. Sell prices are calculated considering servicing costs equal to 8% of the recovered amounts. The cost of deleveraging is the difference between the NBV (calculated for each recovery rate considering a 4% discount rate) and the corresponding sell price.
The securitisation is characterised by the issue of senior and junior notes, considering a split 75% senior and 25% junior and a 2% coupon rate of the senior. Securitisation with guarantee involves the use of the Italian public guarantee (GACS) and based on the following scheme: 84% senior investment grade tranche with a coupon of 3mEuribor + 0.5%; 10% mezzanine tranche with a coupon of 3mEuribor +6%; 6% junior tranche with a coupon of 3mEuribor +15%. We set the 3mEuribor equal to 0% and a cost of GACS equal to 1%. In this case the cost of deleveraging is negative meaning that the average interest rates paid to the noteholders is, on average, lower than 4%, the borrowers' rate used in the Net Book Value calculation. Operationally, the cost of deleveraging is null because the GACS decree states that the the loans must be transferred to the Special Purpose Vehicle for an amount not exceeding their Net Book Value.

Scenario 1 - Base case																		
RR (%)	26	36	43	50	55	62	26	36	43	50	55	62	26	36	43	50	55	62
IRR (%)	*Sell price of direct sale*						*Sell price of securitization*						*Sell price of securitization with guarantee*					
10	15.8	21.8	26.1	30.3	33.4	37.6	19.4	26.8	32.0	37.2	40.9	46.1						
15	14.3	18.7	23.5	27.4	30.1	34.0	17.8	24.7	29.4	34.2	37.7	42.4	20.0	27.7	33.0	38.4	42.2	47.6
20	13.0	17.9	21.4	24.9	27.4	30.9	16.5	22.9	27.3	31.7	34.9	39.4						
25	11.9	16.4	19.6	22.8	25.1	28.3	15.4	21.3	25.4	29.5	32.5	36.6						
	Cost of direct sale						*Cost of securitization*						*Cost of securitization with guarantee*					
10	3.8	5.4	6.4	7.4	8.1	9.2	0.2	0.4	0.5	0.5	0.6	0.7						
15	5.3	8.5	9.0	10.3	11.4	12.8	1.8	2.5	3.1	3.5	3.8	4.4	-0.4	-0.5	-0.5	-0.7	-0.7	-0.8
20	6.6	9.3	11.1	12.8	14.1	15.9	3.1	4.3	5.2	6.0	6.6	7.4						
25	7.7	10.8	12.9	14.9	16.4	18.5	4.2	5.9	7.1	8.2	9.0	10.2						

Table 2

Sell price and cost of deleveraging: *12-yrs time to recovery scenario*

This table reports the sell price of the NPLs portfolio and its cost of deleveraging under the *12-yrs time to recovery scenario*. This case assumes a recovery procedure spread over 12 years where the cash flows, in terms of amounts (and time), are the following: 45% of cash flows in the first 3 years, 65% by the 5th year; 70% by the 6th year and the rest, on equal basis, by the 12th year. We assume 6 expected recovery rates (RR): following the findings of Ciocchetta et al. (2016), 26% is the lowest average recovery rate recorded in 2014 for unsecured loans; 36% is the average recovery rate of unsecured loans during the 2006-15 period; 43% is the average recovery rate during the 2006-15 period; 55% is the average recovery rate of secured loans during the 2006-15 period; 62% is the highest RR of secured loans recorded in 2006. We add the 50% recovery rate, calculated considering the average Italian NBV of bad loans (37.7%). We consider four levels of IRR demanded by potential investors, from 10% to 25%. The sell price is calculated considering servicing costs equal to 8% of the recovered amounts. The cost of deleveraging is the difference between the NBV (calculated for each recovery rate) and the corresponding sell price.
The securitisation is characterised by the issue of senior and junior notes, considering a split 75% senior and 25% junior and a 2% coupon rate of the senior. Securitisation with guarantee involves the use of the Italian public guarantee (GACS) and based on the following scheme: 84% senior investment grade tranche with a coupon of 3mEuribor + 0.5%; 10% mezzanine tranche with a coupon of 3mEuribor +6%; 6% junior tranche with a coupon of 3mEuribor +15%. We set the 3mEuribor equal to 0% and a cost of GACS equal to 1%.

Scenario 2 - 12-yrs time to recovery																		
RR (%)	26	36	43	50	55	62	26	36	43	50	55	62	26	36	43	50	55	62
IRR (%)	*Sell price of direct sale*						*Sell price of securitization*						*Sell price of securitization with guarantee*					
10	12.9	17.9	21.4	24.9	27.4	30.8	18.2	25.2	30.1	35.0	38.8	43.4						
15	11.6	16.1	19.3	22.4	24.6	27.8	16.3	22.6	27.0	31.4	34.5	38.8	19.0	26.2	31.4	36.4	40.1	45.2
20	10.6	14.6	17.5	20.3	22.3	25.2	14.7	20.4	24.4	28.3	31.1	35.1						
25	9.7	13.4	16.0	18.6	20.4	23.0	13.4	18.6	22.2	25.8	28.3	32.0						
	Cost of direct sale						*Cost of securitization*						*Cost of securitization with guarantee*					
10	6.7	9.3	11.1	12.8	14.1	16.0	1.4	2.0	2.4	2.7	2.7	3.4						
15	8.0	11.1	13.2	15.3	16.9	19.0	3.3	4.6	5.5	6.3	7.0	8.0	0.6	1.0	1.1	1.3	1.4	1.6
20	9.0	12.6	15.0	17.4	19.2	21.6	4.9	6.8	8.1	9.4	10.4	11.7						
25	9.9	13.8	16.5	19.1	21.1	23.8	6.2	8.6	10.3	11.9	13.2	14.8						

Table 3

Sell price and cost of deleveraging: *5% lower recovery rate scenario*

This table reports the sell price of the NPLs portfolio and its cost of deleveraging under the *5% lower recovery rate scenario*. This case assumes a recovery procedure spread over 10 years and distributed as follows: 60% of cash flows in the first 3 years, 80% by the 5th year and the rest, on equal basis, by the 10th year.
As in the other scenarios, we assume 6 expected recovery rates (RR) but we set a 5% discrepancy in the recovery rate evaluation between the bank and the investor. This means that we reduce by 5% the recovery rates suggested by Ciocchetta et al. (2016): 21% instead of 26% (the lowest average recovery rate recorded in 2014 for unsecured loans); 31% instead of 36% (the average recovery rate of unsecured loans during the 2006-15 period); 41% instead of 43% (the average recovery rate during the 2006-15 period); 50% instead of 55% (the average recovery rate of secured loans during the 2006-15 period); 57% instead of 62% (the highest RR of secured loans recorded in 2006). We add the 45% recovery rate instead of 50% (corresponding to the average Italian NBV of bad loans in 2017 equal to 37.7%). We consider four levels of IRR demanded by potential investors, from 10% to 25%. The sell price is calculated considering servicing costs equal to 8% of the recovered amounts. The cost of deleveraging is the difference between the NBV (calculated for each recovery rate) and the corresponding sell price.
The securitisation is characterised by the issue of senior and junior notes, considering a split 75% senior and 25% junior and a 2% coupon rate of the senior. Securitisation with guarantee involves the use of the Italian public guarantee (GACS) and based on the following scheme: 84% senior investment grade tranche with a coupon of 3mEuribor + 0.5%; 10% mezzanine tranche with a coupon of 3mEuribor +6%; 6% junior tranche with a coupon of 3mEuribor +15%. We set the 3mEuribor equal to 0% and a cost of GACS equal to 1%.

Scenario 3 - 5% lower recovery rate																		
RR (%)	21	31	38	45	50	57	21	31	38	45	50	57	21	31	38	45	50	57
IRR (%)	*Sell price of direct sale*						*Sell price of securitization*						*Sell price of securitization with guarantee*					
10	12.7	18.8	23.1	27.3	30.3	34.6	15.6	23.1	28.3	33.5	37.2	42.4						
15	11.5	17.0	20.8	24.7	27.4	31.2	14.4	21.3	26.1	30.8	34.3	39.1	16.1	23.8	29.2	34.6	38.4	43.8
20	10.5	15.4	18.9	22.4	24.9	28.4	13.3	19.7	24.1	28.6	31.7	36.2						
25	9.6	14.1	17.5	20.5	22.8	26.0	12.4	18.3	22.5	26.6	29.5	33.7						
	Cost of direct sale						*Cost of securitization*						*Cost of securitization with guarantee*					
10	6.9	8.4	9.4	10.4	11.2	12.2	4.0	4.1	4.2	4.2	4.3	4.4						
15	8.1	10.2	11.7	13.0	14.1	15.6	5.2	5.9	6.4	6.9	7.2	7.7	3.5	3.4	3.3	3.1	3.1	3.0
20	9.1	11.8	13.6	15.3	16.6	18.4	6.3	7.5	8.4	9.1	9.8	10.6						
25	10.0	13.1	15.0	17.2	18.7	20.8	7.2	8.9	10.0	11.1	12.0	13.1						

Table 4

Sell price and cost of deleveraging: *worst-case scenario*

This table reports the sell price of the NPLs portfolio and its cost of deleveraging under the *worst case scenario*. This case assumes a recovery procedure spread over over 12 years where the cash flows, in terms of amounts (and time), are the following: 45% of cash flows in the first 3 years, 65% by the 5th year; 70% by the 6th year and the rest, on equal basis, by the 12th year. As in *5% lower recovery rate scenario* we set a 5% discrepancy in the recovery rate evaluation between the bank and the investor. This means that we reduce by 5% the recovery rates suggested by Ciocchetta et al. (2016): 21% instead of 26% (the lowest average recovery rate recorded in 2014 for unsecured loans); 31% instead of 36% (the average recovery rate of unsecured loans during the 2006-15 period); 41% instead of 43% (the average recovery rate during the 2006-15 period); 50% instead of 55% (the average recovery rate of secured loans during the 2006-15 period); 57% instead of 62% (the highest RR of secured loans recorded in 2006). We add the 45% recovery rate instead of 50% (corresponding to the average Italian NBV of bad loans in 2017 equal to 37.7%). We consider four levels of IRR demanded by potential investors, from 10% to 25%. The sell price is calculated considering servicing costs equal to 8% of the recovered amounts. The cost of deleveraging is the difference between the NBV (calculated for each recovery rate) and the corresponding sell price.
The securitisation is characterised by the issue of senior and junior notes, considering a split 75% senior and 25% junior and a 2% coupon rate of the senior. Securitisation with guarantee involves the use of the Italian public guarantee (GACS) and based on the following scheme: 84% senior investment grade tranche with a coupon of 3mEuribor + 0.5%; 10% mezzanine tranche with a coupon of 3mEuribor +6%; 6% junior tranche with a coupon of 3mEuribor +15%. We set the 3mEuribor equal to 0% and a cost of GACS equal to 1%.

Scenario 4 - Worst Case																		
RR (%)	21	31	38	45	50	57	21	31	38	45	50	57	21	31	38	45	50	57
IRR (%)	*Sell price of direct sale*						*Sell price of securitization*						*Sell price of securitization with guarantee*					
10	10.4	15.4	18.9	22.4	24.9	28.4	14.7	21.7	26.6	31.5	35.0	39.9						
15	9.4	13.9	17.0	20.1	22.4	25.5	13.2	19.4	23.8	28.2	31.4	35.7	15.3	22.6	27.7	32.8	36.4	41.6
20	8.5	12.6	15.4	18.3	20.3	23.2	11.9	17.5	21.5	25.5	28.3	32.3						
25	7.8	11.5	14.1	16.7	18.6	21.2	10.8	16.0	19.6	23.2	25.8	29.4						
	Cost of direct sale						*Cost of securitization*						*Cost of securitization with guarantee*					
10	9.2	11.8	13.6	15.3	16.6	18.4	4.9	5.5	5.9	6.2	6.5	6.9						
15	10.2	13.3	15.5	17.6	19.1	21.3	6.4	7.8	8.7	9.5	10.1	11.1	4.3	4.6	4.8	4.9	5.1	5.2
20	11.1	14.6	17.1	19.4	21.2	23.6	7.7	9.7	11.0	12.2	13.2	14.5						
25	11.8	15.7	18.4	21.0	22.9	25.6	8.8	11.2	12.9	14.5	15.7	17.4						