Notes on Financial Stability and Supervision

Why exceptional NPLs sales should not affect the estimated LGDs of A-IRB banks

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Summary

The reduction of the large stock of non-performing loans (NPLs) in banks' portfolios is a supervisory priority for the European Union and the Single Supervisory Mechanism (SSM). NPLs sales – an effective and rapid way to pursue the objective – tend to have a negative impact on banks' capital ratios via direct losses, because the sale prices are typically lower than their book value. Therefore aggressive sales can cause economic losses and capital shortfalls that, especially in the current difficult market conditions and low profitability environment, banks may be unable to address. This represents a powerful disincentive for banks to sell. Banks using the advanced internal ratings-based method (A-IRB) face even stronger disincentives, as an additional impact on capital comes from the higher Loss Given Default (LGD) estimate induced by the NPLs sale.

This note has three main purposes. First, we provide an assessment of the impact of massive NPLs sale on LGD estimates and capital ratios. For a sample of Italian banks, we find that following a 12 percentage points increase in the LGD – an effect which could be triggered by an exceptional disposal of bad loans at "market prices" – the decrease of capital ratios stemming exclusively from the worsening of the LGD and from the increase of the IRB shortfall could be in the range of 90-190 bps. These estimates do not take into

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account the direct losses resulting from selling the loans at lower prices than their book value. Second, we argue that allowing the losses from such an exceptional sale to affect the LGD estimates is undesirable and unwarranted in the current situation above all for macro-prudential reasons. Third, we provide some proposals on how to sterilize, or at least mitigate, the effect of NPLs sales on the LGD, in order to avoid any possible disincentive for A-IRB banks to sell. All proposals rely on the exceptionality of the sales and, thus, on the temporary nature of the sterilization mechanism.

1   Introduction and motivation

Negative externalities may discourage banks to reduce their stock of NPLs up to the "optimal" macro-economic level

The micro-prudential effects of high levels of NPLs (non-performing loans) are well-known: they tend to depress a bank's market valuation, increase its cost of funding and reduce its willingness to lend. These effects mainly stem from the opaque nature of these assets, and by the perception that the bank's levels of provisioning may be inadequate. There is by now broad consensus on the view that when the high NPL phenomenon is widespread, affecting a significant share of banks in a country or region, it also tends to have macro-prudential consequences: it may affect the credit supply mechanism, with negative effects on real and nominal growth in that country or region, and ultimately on financial stability.[1] These consequences can be qualified as externalities, as they go beyond the individual bank's typical areas of concern.

The presence of externalities suggests that market forces alone might be insufficient to address the problem, and that action by the policymaker may be required. Indeed, European and national authorities have been actively trying to foster the reduction of the stock of non-performing exposures of European banks. This is due to the huge size of this stock, which is currently declining but still stands at over 1 trillion euros (gross of provisions). The problem is multi-faceted, and requires policies on several fronts. Recent examples include using public funds to set up asset management companies[2] with the mandate to buy NPLs (an option that is much more difficult to implement today, due to changes in regulation); reforms of legal framework in countries characterized by very long/inefficient credit recovery procedures; supervisory actions promoting a pro-active attitude to NPLs management on the part of banks; measures to foster the development of a secondary market for NPLs. These policies are bringing substantial benefits, but they have so far been unable to definitely tackle the problem.

As banks may be reluctant to take action due to externalities, policy actions should encourage them to do so. Indeed, the SSM is moving in this direction. A recently released non-binding Guidance spurs banks to adopt a pro-active attitude towards their NPLs portfolios: internal workout strategies should be optimized; appropriate incentive schemes for managers should be adopted, and conflicts of interest should be addressed; data quality should be improved. A stocktake on national frameworks, published together with the Guidance, contains useful evidence for governments

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1)   See e.g. Ayiar et al., "A strategy for resolving Europe's problem loans", IMF staff discussion note, September 2015.

2)   For instance, the National Asset Management Agency (NAMA) in Ireland, the Sociedad de Gestión de Activos procedentes de la Reestructuración Bancaria (SAREB) in Spain, the Bank Asset Management Company (BAMC) in Slovenia.

intending to make their national legal framework more conducive to effective and fast NPL resolution.[3]

To help banks reduce their stock of NPLs this paper proposes a specific policy, targeted at banks adopting the advanced internal ratings-based model (A-IRB) approach.[4] In a nutshell, the idea is to sterilize, or at least mitigate, the effect of NPLs sales on the loss given default (LGD) parameter of A-IRB models. We show that in the absence of this intervention, the sale would trigger a significant decline in the banks' capital ratios, since the market prices are on average much lower than banks' internal recovery values. We argue that this effect would give A-IRB banks a powerful disincentive to sell their NPLs, and may not be justified on economic and prudential grounds.

This proposal would bring several benefits. Firstly, a significant share of the entire stock of NPEs in the EU is under A-IRB models (about 450 billion of the total of 1 trillion); hence the proposed sterilization mechanism has the potential to set in motion sizeable NPLs disposals, materially affecting the macro dimension of the problem. Indeed, anecdotal evidence suggests that some A-IRB banks are keenly aware of this issue, and could take action if some form of sterilization were implemented. Secondly, for technical reasons, which we illustrate below, an NPLs sale will tend to affect the prudential ratios of an A-IRB bank much more heavily than for a bank using the standard approach. Thus, it makes sense to eliminate or reduce this extra penalization. Third, the proposal makes up for a shortcoming of the macro-prudential toolbox foreseen by the European regulatory framework (CRR-CRDIV). The CRR-CRDIV does not contain instruments adequate to manage this problem, in spite of its genuinely macro-prudential nature. This is probably one reason why EU and national macroprudential authorities have so far been relatively silent on the NPL issue.

2   The effect of exceptional NPLs sales on the LGD and capital ratios: an impact assessment

2.1   Basics of the mechanism

When massive sales occur, the sale price of NPLs is driven by the buyer's expected return on the investment

The sale price of an NPL is typically much lower than the value at which it is booked in a bank's balance sheet. This value-price differential can be due to many reasons, but one driver is buyers' criteria to price these assets, which are very different from those prescribed by the accounting standards that banks are required to follow. In particular, it can be shown that the buyer's expected return on the investment, typically very high, can explain a large portion of the value-price differential.[5] Thus, in general an NPLs sale will reduce profits, or cause a loss. In the latter case it will reduce a bank's own funds.

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3) See Stocktake of national supervisory practices and legal frameworks related to NPLs.

4) The proposal would not apply to banks using the foundations IRB approach, since the latter provides fixed values for the LGD.

5) The price that buyers active in the NPL market are willing to offer typically incorporates: a large risk premium and a related expected profit made by the buyer; a liquidity premium, as there is little or no secondary market for bad loans; a frontloading of the administrative costs that banks incur annually over the recovery horizon. For an analysis of these factors and their effect on the differential between book value and sale price see Ciavoliello et al., "What's the value of NPLs?", Banca d'Italia, Notes on financial stability and supervision, no. 3, 2016, available at www.bancaditalia.it.

For a bank adopting the standardized method, an NPLs sale affects capital ratios via two basic channels: (i) via the impact on the income statement just described; (ii) via a reduction of RWAs (NPLs are typically weighted at 150%/100% depending on specific credit risk adjustments). Note that channel (ii) would increase the bank's capital ratios.

For an A-IRB bank channel (i) operates in the same way. The second channel is more complex; it may cause a further reduction of the capital ratios, giving A-IRB banks an additional disincentive to sell NPLs. In detail, two sub-channels are at work: (ii.a) a sale at low values causes, other things held constant, a higher loss than a standard in-house work off. Since the sale-related losses routinely enter the dataset used to estimate the LGD, a sale at low values will increase the LGD. This, via the regulatory formula, will increase the RWA for performing assets, reducing the capital ratios. (ii.b) In addition, the increase in the LGD will lead to an increase of the expected loss amounts (and of the "IRB shortfall") for both the defaulted exposures that are not sold and the performing exposures[6], which must be either covered by further provisions or deducted from the common equity tier1 (CET1).

2.2   Estimating the impact of NPLs sales: main assumptions

An accurate simulation of the impact of a massive NPLs sale on the capital ratios of A-IRB banks would require granular information concerning, inter alia, the number of data points included in the data sets used for estimating the LGDs, the number of positions actually sold, the LGD values segmented by clusters, the sale price. Some of these figures will be not available until the operation is finalised: banks could sell a portion of the NPL portfolios, or positions with high (or low) provisions, or a specific portfolio. In addition, sale prices are highly uncertain, as the market is very thin and heterogeneous. Since these elements of uncertainty cannot be addressed ex ante, we adopt a top-down approach.

The methodology, illustrated in detail in Annex 1, is applied to 5 Italian SIs that adopt the A-IRB method; it relies on strong assumptions, some of which are worth highlighting:

(i) banks sell the entire bad loans portfolio, amounting on average to 60% of all NPLs of the banks in the sample. This is clearly an extreme assumption, but it gives an upper bound of the effect; since the effect is roughly linear under certain assumptions, our estimates give a measure of the size of the effect as a function of NPL volumes sold.

(ii) the sale price is equal to 16% of the gross book value of the NPL portfolio. This is also questionable, as it is well-known that actual prices are highly heterogeneous and depend on a number of characteristics of each portfolio sold.

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6) The IRB shortfall, which must be deduced from CET1, is defined as the difference between expected loss amounts and generic and specific credit risk adjustments according to article 159 CRR.

As result of assumptions i) and ii), the NPLs sale causes a 12 percentage points increase in the LGD; this arguably captures the effect of a massive sale of NPLs at an aggressive "market price".[7] The LGD increase would result in a corresponding increase of RWAs (approximately 20%).

2.3   Main results

The overall decrease of the CET1 ratio would be in the range of 90-190 bps

Based on our simulations, the effect (ii.a) would cause a fall in the CET1 ratio in the range of 60-110 bps. Adding effect (ii.b), the overall decrease of the CET1 ratio would be in the range of 90-190 bps, with a median value of 152 bps (Figure). Evidence not reported shows that the impact is (very) roughly linear, so that if the banks decided to sell half of their bad loans portfolios (rather than the total), the effect in terms of capital and basis points would also be roughly half. As stressed in paragraph 2.1, the ultimate impact will depend on further features of the actual NPLs sale that cannot be known before the sale is finalized, beginning with the impact on the income statement, which we overlook here.

CET 1 reduction due to an exceptional bad loan sale (1)

■ Only RWA increase via LGD (effect ii.a)   ■ Additional effect on EL (effect ii.b)
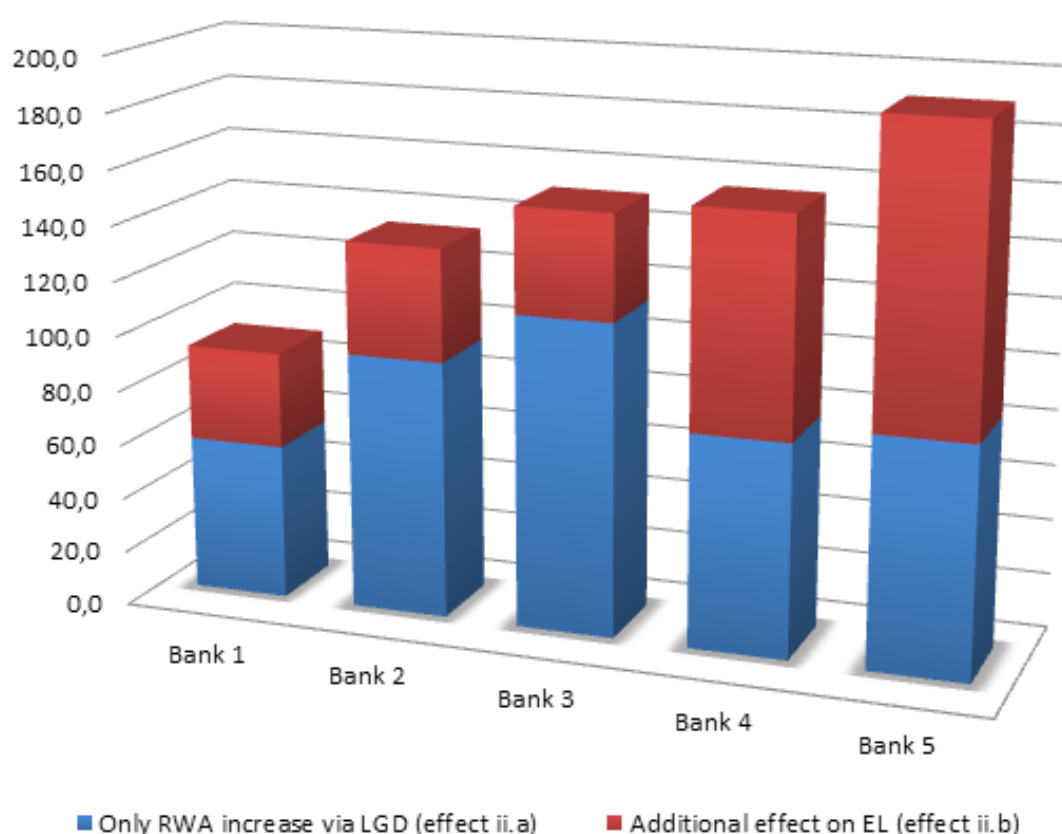
(1) Simulation results for five Italian banks adopting the A-IRB method. See the text and Annex 1 for details about the exercise and the methodology. The effects overlook the direct impact that would occur via the income statement.

7)   In reality, we need a few additional assumptions to obtain the 12 p.p. LGD increase. Specifically, we assume that the current LGD, estimated using m defaulted positions, is 60% (about equal to the average coverage ratio of bad loans in our sample). A sale of n positions at 16% of GBV would cause the estimated LGD to increase to (60%*m+84%*n)/(m+n). If m=n the LGD would increase by 12 percentage points, to 72%. The plausibility of the assumption that m is roughly equal to n is clearly arbitrary and should be checked case by case.

3 Why including losses from exceptional NPLs sales in the LGD dataset is not appropriate

In normal circumstances, sales are just one of the options available to NPL managers to do their job. In-house recovery may be suboptimal for certain positions, and a sale, even at low prices, may well be the value-maximizing option. Therefore, losses related to NPLs sales should routinely be included in the dataset for the estimation of the LGD.

However, the current exceptional circumstances, in which large stocks of NPLs are perceived as a threat to the EU financial stability, justify a different approach. First of all, as explained above, under such circumstances NPLs generate externalities which warrant heeding macro-prudential considerations. From this viewpoint, asking A-IRB banks to fully include large NPLs sales in the LGD dataset would strongly discourage them from engaging in NPLs sales, as impacts on capital ratios (over and above those coming through the income statement) are potentially large. Thus, macro-prudential considerations warrant removing this disincentive, coherently with the emphasis given by the SSM to the need to reduce the stock of NPLs.[8]

Secondly, a macro-prudential policy that excluded exceptional NPLs sales from the LGD dataset would not be inconsistent with micro-prudential considerations. The prices of NPL positions sold to investors are generally much lower than the recovery rates obtained via internal work-out.[9] But exceptionally large sales will necessarily include positions that under normal circumstances would have been worked out internally. The inclusion of a large number of data points pertaining to such exceptional sales in the LGD dataset would bias LGD estimates upwards, reducing the model's predictive power.

Furthermore, truly exceptional bad loans sales would generate massive portfolio improvement effects: the higher the share of bad loans sold by the bank, the better the average quality of the remaining credit portfolio. But a purely backward looking estimate of the new LGDs would not incorporate this improvement effect, and would yield an increase in the capital requirement proportional to the size of the sale, a rather counterintuitive result.

Finally, in case of massive NPLs sales, the bank receives a lump sum for the entire portfolio. Thus, there is not an objective way to allocate to each individual position

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8) In principle, since banks are reluctant to take action due to an externality, forcing – rather than incentivizing – them to sell NPLs could also be a solution. However, such a policy would be self-defeating. If many banks tried to sell massive amounts of NPLs all at once and in a short time, the sale price could fall significantly, as markets for these assets are thin and illiquid (also because the buy side is composed of a relatively small number of specialized investors). This would exacerbate the impact of the sale on banks' income statement and on capital. Furthermore, at present, the very low profitability of EU banks – due to the legacy of the crisis, the technological change, etc. – makes access to capital markets exceedingly difficult. Thus, forced sales impacting on a bank's capital could result in its resolution or liquidation, aggravating rather than alleviating the financial stability problem. Such an approach could also be challenged on legal grounds, as there is nothing in prudential regulation prohibiting banks to hold high NPL levels.

9) See G. Santini et al., *Bad loans recovery rates*, Banca d'Italia, Notes on Financial Stability and Supervision, no. 7, 2017, forthcoming.

(and facility type) a price and a recovery rate in an appropriate manner. To input data in the LGD dataset one must therefore resort to assumptions. This problem arises in general when observations of losses stemming from the sale of (non-homogeneous) portfolios must be included in the LGD database; however, it becomes material in the case of exceptionally large NPLs sales, as the new observations would strongly influence the database.

4 Regulation

The current European Regulatory framework does not provide for specific rules concerning the treatment of credit disposals as to the estimation of regulatory parameters such as the LGD. A consultation paper containing Guidelines on PD estimation, LGD estimation and the treatment of defaulted exposures has just been published by the EBA.[10]

The CRR generally requires that an institution's estimates of the risk parameters "shall incorporate all relevant data, information and methods" (art. 179.1.a CRR), and that such estimates "shall reflect the implications of (…) new data and other information, as it becomes available" (art. 179.1.c CRR).

However, art. 179.1.d also requires that "the population of exposures represented in the data used for estimation, the lending standards used when the data was generated and other relevant characteristics shall be comparable with those of the institution's exposures and standards; the economic or market conditions that underlie the data shall be relevant to current and foreseeable conditions." It is questionable that such a condition would hold in case of massive sales of NPLs, where the banks are obliged to accept market prices which do not reflect their normal recovery rates. Hence, to the extent that the inclusion of loss data coming from an exceptional sale can distort the LGD estimates, making it non representative in a forward looking perspective, excluding these data would comply with article 179.1.c and 1.d CRR. A similar approach could be warranted for extraordinary events such as mergers & acquisitions.

The issue of NPLs sales is not treated in the sections of the CRD-CRR dealing with macro-prudential regulation. Probably this is for good reasons, as thus far experience has shown that in principle any micro-prudential instrument can be used for macro-prudential purposes, and it would be impossible to grant macro-prudential authorities control of each micro-prudential tool via ad hoc rules text for each possible tool. On the other hand, the CRR already foresees prescriptions aimed to adjust prudential treatment of IRB parameters on the basis of financial stability considerations. For this reason the macro-prudential framework should allow, under exceptional circumstances

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10) The paper, published on 14 November 2016, recommends not excluding losses related to sale of NPLs, but allowing appropriate data adjustments (and additional margin of conservatism) in case of non-representativeness. See Guidelines on PD estimation, LGD estimation and the treatment of defaulted exposures.

which can affect the overall stability of the financial sector, to sterilize an LGD increase along the lines illustrated below.

5   Proposals

To avoid disincentives to the bad loans disposal, one could sterilize the impact of exceptional NPLs sales on the LGD for a limited period of time. While this scheme would apply to A-IRB banks only, it could have material effects on a problem whose solution has proved elusive so far. The losses due to the sale would be recorded to the income statement, and therefore would have an impact on capital ratios, but their impact on the estimated LGD could be eliminated, or dampened. Three options could be explored to this end, in decreasing order of effectiveness:

1) *full sterilization*: the losses due to the exceptional sales would be fully and permanently eliminated from the dataset used for the LGD estimation. This would apply for a limited period (e.g. 2 to 3 years), so as to create the appropriate incentive to sell. Any sale occurring past the announced deadline would instead feed the estimation dataset.

2) *LGD adjustment*: the sale-related losses would be used to estimate the LGD, but they would be adjusted (reduced) to account for the various factors that explain the differential between book value and sale price, illustrated above. This option would require an estimate of the adjustment factor. A proxy could be obtained by comparing the loss rate embedded in the price paid by investors with the one expected from ordinary recovery procedures. This could present operational challenges, as reliable data on sale prices are not readily available. Other mechanisms could be envisaged. This methodology could benefit from the work that the EBA is doing as to the guidelines on "PD estimation, LGD estimation and the treatment of defaulted exposures".

3) *phasing-in*: losses due to the sale would be gradually included in the data-set over a predetermined period of time (for example 3–5 years); the rationale is that if the banks had closed those positions following the ordinary recovery procedures, the inclusion of those data in the estimates would have required more time. This option would overlook the incentive/externality problem faced by the banks and the distortion in the LGD estimate created by using such data points. Furthermore it is unlikely to eliminate the disincentive to sell NPLs.

All the above variants build on the assumption that these losses are exceptional and linked to a specific situation of the EU banking system, which warrants adoption of macro-prudential measures. They could be complemented with a size threshold. Specifically, a sale could be labelled as exceptional, and deemed eligible for sterilization, only if it achieved a sizeable reduction of the bank's stock of NPLs. A threshold could be set in terms of percentage volume of a banks' stock of NPLs. Clearly, the calibration of this threshold should be carefully considered: higher values would magnify the impact of NPLs sales on outstanding amounts, but would reduce the likelihood of the sales themselves.

Another non-mutually exclusive option would be to provide an explicit prescription within the CRR framework about the impact of exceptional NPLs sales on LGD estimation, on the basis of financial stability considerations as set forth in CRR. This prescription could be considered within the broader context of CRR revision that is underway. In order to ensure consistency across European countries, the EBA could develop draft regulatory technical standards to specify the conditions for data exclusions for financial stability reasons (similar to the prescription provided, for instance, in art. 124 CRR).

Estimate of the impact of a credit sale via its effect on the LGD of A-IRB banks

A) Framework: RWA

1) We assume that the average LGD on bad loans ("sofferenze") is close to the coverage ratio actually observed among Italian banks, i.e. approximately 60% (i.e. $LGD_{\text{soff}} = 60\%$). We assume also that the number of positions sold (n) are equal to those in the dataset for computing LGD_{soff} (m).

2) Let us call $LGD_{\text{soff(ps)}}$ the LGD recalculated taking into account the bad loans sale. At one extreme, the sale might take place at net book value, leading to a 0% increase of the $LGD_{\text{soff(ps)}}$. At the other extreme, the sale price could be zero, leading to a total loss. In the latter case $LGD_{\text{soff(ps)}}$ would reach a value of 80%, (100%+60%/2), corresponding to an increase close to 30% $\cong$(80%-60%)/60%). Both cases are purely theoretical (see par. 2.1); therefore we can assume that the real world is in between.

3) The above mentioned considerations lead to a pragmatic approach: we can reasonably assume an expected increase of LGD in the range of 0%-30%; we can set it conservatively at 20% (more than the average) that corresponds to a sale price of 16 out 100 Gross Book Value (GBV). Indeed it means that the LGD of the new observations is 84% (100%-16%); if m=n, the resulting LGD will be 72% (i.e. (84+60)/2), i.e. 12 p.p. more than the initial value of LGD (60%). Note that 12 (increase of LGD in percentage points) is 20% of 60 (initial value of LGD).

4) Once defined the LGD variation induced by bad loans sale, we need to understand how this results in a variation of RWAs and capital ratio. To this end, it is worth noting that the LGD for performing exposures can be written as: $LGD_{\text{perf}} = \beta \times LGD_{\text{soff}}$, where β is the probability that a defaulted exposure becomes a bad loan (i.e. it does not return to "performing" status); for the sake of simplicity we can consider this as a "danger rate" (i.e. the complement to 1 of "cure rate"). Given the linear relation between LGD_{perf} and $LGD_{\text{soff(ps)}}$, the proportional increase of LGD_{perf} is, by definition, equal to the proportional increase of $LGD_{\text{soff(ps)}}$ (so it will fall within the range 0%-30%).

5) As according to the A-IRB formula for performing exposures there is a linear dependence between RWA and LGD, $\%\Delta RWA_{\text{A-IRB}} = \%\Delta LGD_{\text{perf}}$, and we can calculate the impact on RWA A-IRB as:

$$RWA_{\text{A-IRB(ps)}} = RWA_{\text{A-IRB}} \times (1 + \%\Delta LGD_{\text{perf}})$$

6) Finally, we can calculate the CET1 ratio as the ratio between the current CET1 and the new RWA:

$$CET1r_{\text{(ps)}} = \frac{CET1_{\text{current}}}{TRWA_{\text{(ps)}}}$$

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where $TRWA_{(ps)} = RWA_{\text{A-IRB(ps)}} + ORWA$, and $ORWA$ is the sum of RWA coming from the standardised credit risk, market and operational risk, which would not be affected by the sale.

It is worth highlighting that this approach is only aimed at evaluating the impacts on the RWA calculated for performing exposures, and therefore it does not take into account the effects on defaulted assets and the relevant "shortfall" (i.e. difference between expected loss and credit risk adjustments), component that requires additional assumptions (see paragraph B2).

B) FRAMEWORK: the expected loss amounts (for performing exposures and exposures in default).

B1): performing exposures

7) For performing exposures, the expected loss is: $EL = PD * LGD * EAD$. Hence, the EL is linear in the LGD. We can write the expected loss post sale ($EL_{(ps)}$) as:

$$EL_{(ps)} = PD \times LGD \times EAD \times (1 + \%\Delta LGD_{(ps)})$$

8) the additional amount to be deduced from the CET1 [11] is equal to:

$$\Delta EL_{(ps)} = EL_{(ps)} - EL = EL \times \%\Delta LGD_{(ps)}$$

B2) defaulted assets

9) For the defaulted exposures, we assume that: i) all the bad loans are sold; ii) in line with the empirical evidence stemming from Italian data sources, the bad loans are equal to the 60% of the whole stock of defaulted assets; iii) the expected loss best estimate (i.e. the ELbe) for bad loans (expressed as a percentage of the total bad loans) is higher than ELbe on defaulted exposures not classified as bad loans.

10) Hence, the current amount of expected loss best estimate (nominal amount) is firstly multiplied by 40% (i.e. 100%-60%), in order to subtract the expected losses stemming from bad loans. Secondly, another judgmental coefficient equal to 50% is applied as the ELbe on past due and unlikely to pay exposures is expected to be lower than the average ELbe for bad loans. In addition, as ELbe models are strictly related to LGD models, we assume that also the ELbe is linear in the LGD. As a consequence, the additional amount to be deduced from the CET1 is equal to:

$$\Delta ELbe_{(ps)} = 40\% \times 50\% \times ELbe \times \%\Delta LGD_{(ps)} = 20\% \times ELbe \times \%\Delta LGD_{(ps)}$$

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11) This is true only if the shortfall is higher than or equal to 0. In the case of excess reserve, part of the difference in the expected loss amount offsets the amount that could be recognized in the Tier 2 capital.

11) The final effect on the CET1 ratio of the change in LGD for performing exposures and expected losses is calculated in the following way:

$$CET1r_{(ps)} = \frac{CET1_{current} - (\Delta EL_{(ps)} + \Delta ELbe_{(ps)})}{TRWA_{(ps)}}$$