Monitoring the Current LTV

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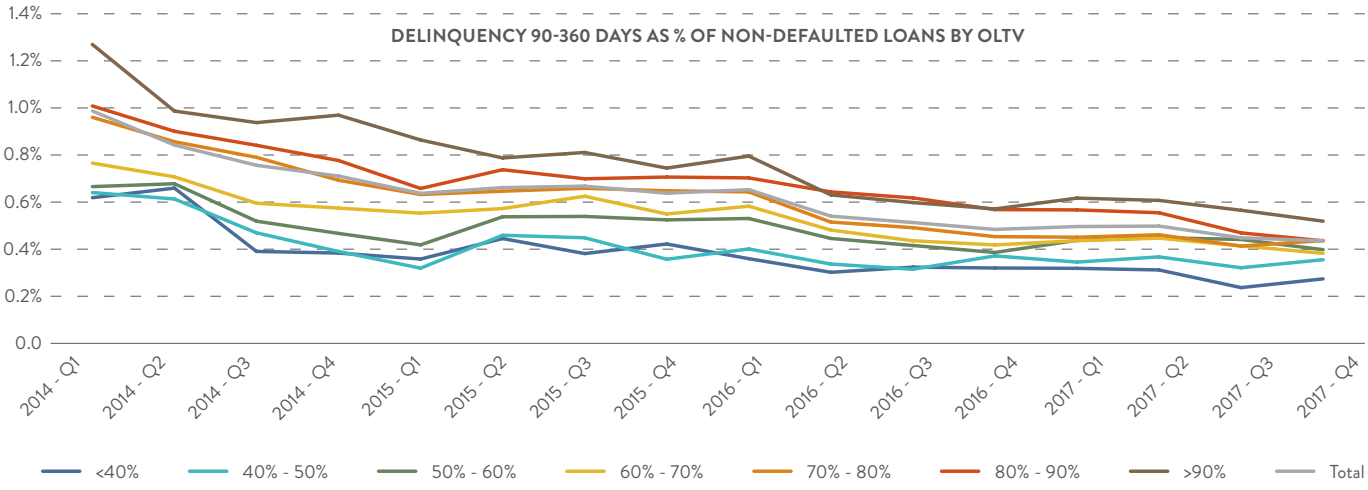
This article follows the publication in the Hypostat 2017 of "The V in LTV and Why it Matters". In last year's article, we used European DataWarehouse's database of securitised loans[1] to discuss the use of the LTV at loan origination (the OLTV) as a predictor of performance.[2] We also discussed the need to adjust the "V" over time, in particular for loss given default calculations. The Current Loan-to-Value (the CLTV), the current amount of a loan compared with the current value of the property used as collateral, typically plays a role in banks' monitoring processes, and high CLTV loans are generally considered riskier and treated in priority.[3] We thus focus this follow-up article on the CLTV and its role in performance monitoring-related issues.

Using our Spanish RMBS performance indices,[4] we find that the CLTV is more strongly related to performance than the OLTV. We also find that this relationship is enduring as it is identified even in old loan vintages. The level of the CLTV can influence loan performance in several ways. Borrowers whose loans are worth more than the value of their property (high CLTV loans) may be reluctant to make further payments and are more likely to default. Conversely, borrowers that can afford to prepay their loans to boost the decrease of their CLTV have a lower probability of default. Also, the fact that lower CLTV loans have an easier access to forbearance options is probably a key explanation for the better performance of these loans. In Europe, regulation aiming at consumer protection requires banks to consider and prefer forbearance options if feasible at no prejudice for the bank, before considering repossessing and liquidating the loan. When there is a risk of making a loss on the loan, the lender would compare the net present value (NPV) of its forbearance options versus the NPV of repossessing the property, which is a direct function of the CLTV. Lower CLTV loans thus perform better than others, because they can benefit from forbearance before becoming delinquent, and if delinquent, they are less likely to stay delinquent. We thus conclude that high CLTV loans should be watched closely as part of the loan monitoring process, particularly when they already have features that would make them ineligible for forbearance. Data on loan valuations indicate that lenders are more careful when valuing high OLTV loans at origination, and that high OLTV loans tend to be revalued somewhat more frequently.

CURRENT LTV AND PERFORMANCE: EVIDENCE FROM SPAIN

Comparing our OLTV-based performance indices to the CLTV-based performance indices for Spain, we find that loan performance is more strongly related to the CLTV than to the OLTV. The case of the Spanish real estate sector is particularly interesting, because it underwent a boom/bust cycle from which it is now recovering. Spanish mortgages are also well represented in European DataWarehouse's securitised loans database. Our Spanish RMBS indices (see description in Appendix 2) track the ratio of loans in arrears by more than 90 days but less than 1 year to the non-defaulted portfolio balance.[5]

EXHIBIT 1A | THE HIGHER THE OLTV, THE WORSE THE PERFORMANCE



Source: European DataWarehouse, upcoming Spanish RMBS Index; Please note: these securitised loans may not be representative of all the loans in the Spanish banking sector. See also our upcoming Spanish RMBS Index and upcoming report on indexed property values and LTVs

[1] See European DataWarehouse, see also Appendix 1

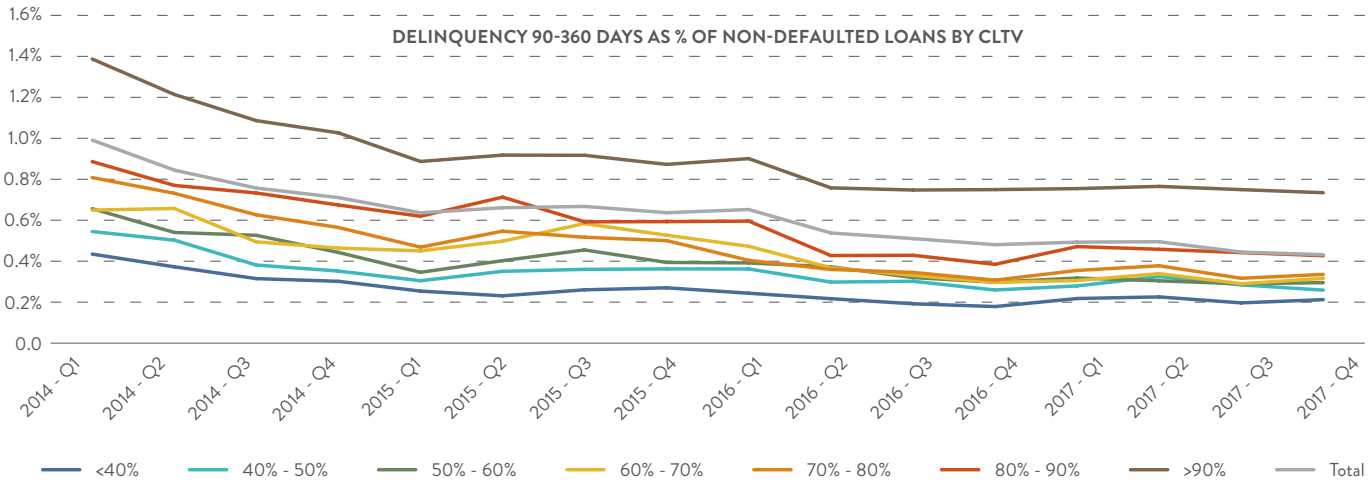
[2] See Hypostat 2017 "The "V" in LTV and Why it Matters"; *The Loan To Value (LTV) ratio "… the ratio between the principal balance on the mortgage and the appraised value of the property serving as security for the loan itself" (DBRS definition)*, is a key credit risk indicator for mortgages. It is used in financial regulation, rating agency methodologies, and bank credit policy. See also the use of the LTV for the calibration of performance assumptions. A high LTV at origination implies higher leverage and risk. Either the borrower had to borrow more to buy the property, or it shows a greater risk appetite if he chose to borrow more. Also, the amount of equity in the property can be used as an indicator of willingness to pay, particularly in non-recourse countries.

[3] See, for example, Moody's servicer updates in Moody's Credit Insight about Barclays in September 2012 and Nationwide Building Society in January 2014.

[4] Upcoming RMBS Indices based on European DataWarehouse loan by loan data.

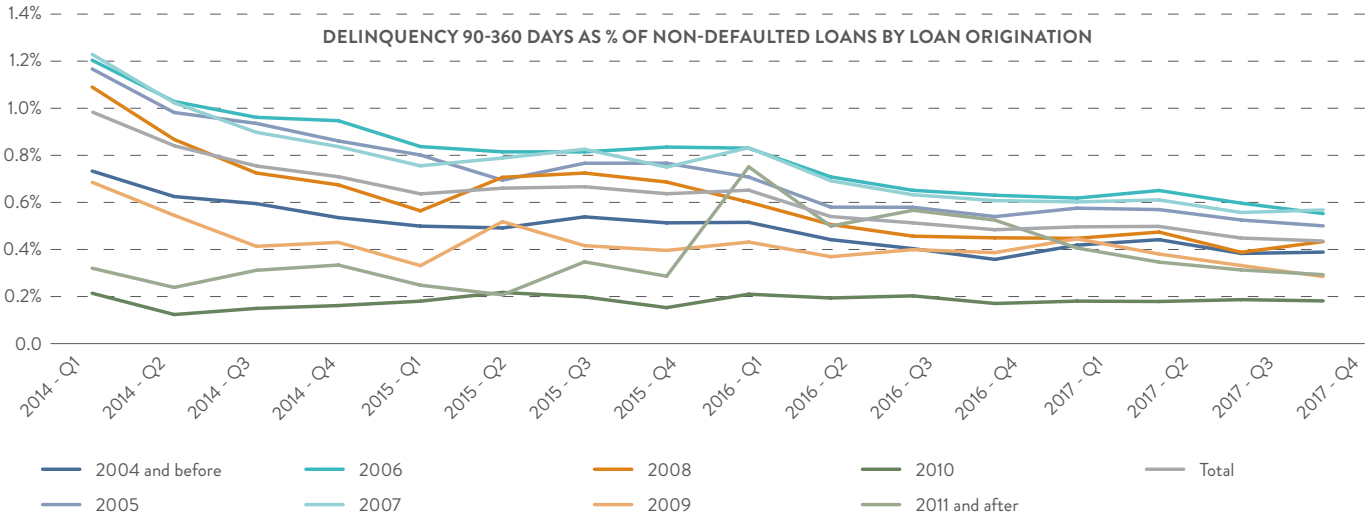
[5] In Spanish securitisations, loans are usually considered defaulted once they become more than 12 or 18 months in arrears.

EXHIBIT 1B | THE HIGHER THE CLTV, THE WORSE THE PERFORMANCE (THE RELATIONSHIP IS EVEN STRONGER)



Source: European DataWarehouse

EXHIBIT 1C | SPANISH RMBS INDEX PERFORMANCE BY LOAN VINTAGE



Source: European DataWarehouse

Exhibit 1a shows our Spanish RMBS index, grouping loans according to their OLTV. Exhibit 1b groups the same loans according to their CLTV, thus leaving the "Total" index unchanged in both charts. Whereas the loans in Exhibit 1a are sorted once in an LTV bucket, in Exhibit 1b, a loan can change categories from one period to the next. Comparing Exhibit 1a to Exhibit 1b, the CLTV appears even more strongly related to performance than the OLTV, particularly in the case of the underperformance of loans with a CLTV greater than 90%.

Exhibit 1c shows that independently of the LTV, there is also a strong loan origination vintage effect, with the vintages 2005-2008 (directly before the crisis) performing substantially worse than others. The better performance of post-2008 vintages can probably be explained by the tightening of lending criteria in the wake of the crisis, while the better performance of older vintages can partially be explained by a survivor bias (the worst loans of these vintages would have defaulted and left the sample prior to 2014), and partially by deleveraging. Perhaps vintage composition also plays a role. In the older vintages of Exhibit 1c, the loans would have on average lower LTVs because they were originated with lower OLTVs and benefitted from deleveraging prior to 2007. As we saw in last year's article, the proportion of high OLTV loans increased in the years directly before the crisis.

Exhibit 2 shows the theoretical effect of house price fluctuations on the CLTV, for a loan issued in Spain with a 20 years maturity and a 3% interest rate, depending on the year of origination. For the 2003-2004 vintages, increasing house prices boosted deleveraging until 2007. In the following vintages, amortisation barely compensated for the effect of declining house prices for several years. For the worst performing vintages of Exhibit 1c (vintages 2005-2008), deleveraging goes into reverse after a while, as declining house

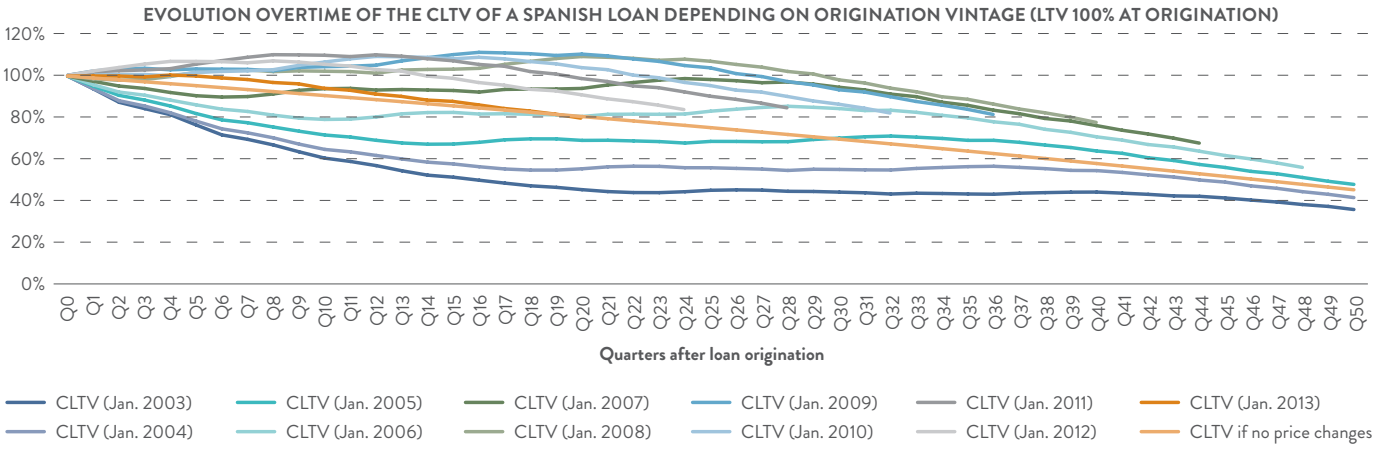
prices outpace loan amortisation. For the 2009+ "crisis" vintages, for which the CLTV would stay at very high levels, performance is better than that of the 2005-2008 vintages, with lower CLTVs. The better performance of the 2009+ vintages in Exhibit 1c, despite their higher CLTVs, is probably also due to the tightening of credit that took place in the wake of the crisis. For vintages 2013 onwards, the house price recovery keeps the CLTV close to what amortisation would be like with static house prices.

Exhibit 3 shows performance based on a CLTV/Vintage segmentation, again using the same loan data but aggregating it in different buckets. Within a vintage category, lower LTV loans perform better and high LTV loans worse, but within a LTV bucket category, recent loans perform better than older loans. The apparent better than index performance of older loans thus appears driven by their leverage rather than by their seasoning.

The better than average performance of the loans with lower CLTV can have several explanations. First, if we focus on the numerator of the CLTV (the loan amount), a borrower with sufficiently high earnings may prepay his loan, thus amortising his loan faster and bringing it into the lower CLTV categories. Conversely, a borrower having trouble repaying his loan and having already benefitted from relief (forbearance) measures is likely to deleverage more slowly all things being equal. The worse performance of the very high CLTV loans can also be driven by borrowers becoming unwilling to pay for properties that are worth less than the value of the loan. This latter observation is expected to be particularly true for non-recourse countries, where the property is the only guarantee for the collateral. However, it is with respect to the access to forbearance measures and their success that the CLTV can be expected to play a pivotal role.

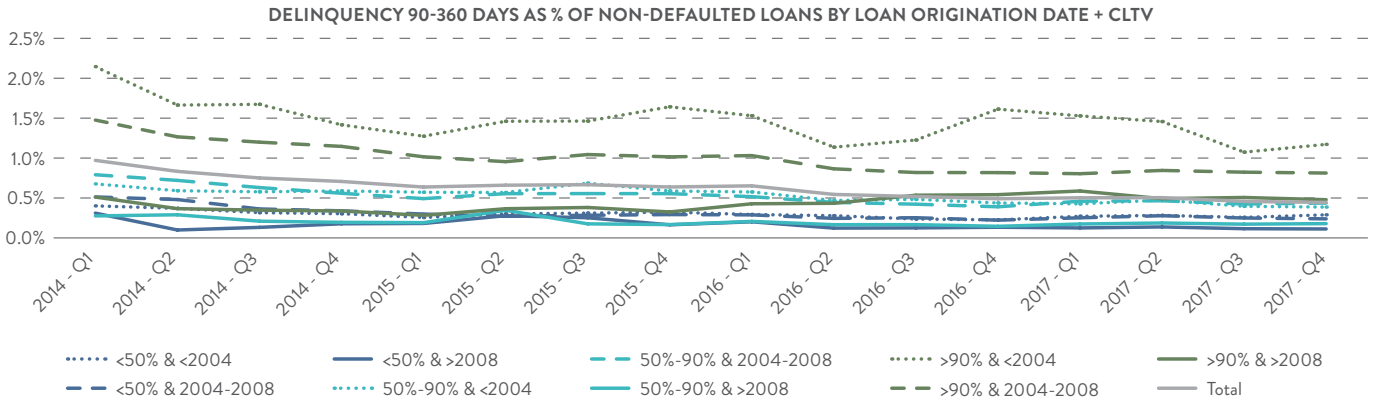
If the OLTV plays a role in the loan origination process, the CLTV can be considered as a key indicator of a borrower's potential eligibility for forbearance. A loan with a lower CLTV could be less likely to be in arrears because it can either avoid delinquency status altogether by pre-emptively undergoing modifications, or once delinquent, it can more easily benefit from loan modifications and cure. For our Exhibit 4, we followed the batch of Spanish mortgages that were not delinquent in 2014,[6] with a maturity date in 2018 or beyond, and that became delinquent in 2015. Exhibit 4 shows the last status available for these loans as of Q4 2017.

EXHIBIT 2 | EFFECT OF HOUSE PRICE FLUCTUATIONS ON THE CLTV (EXAMPLE FOR SPAIN)



Source: European DataWarehouse; CLTV of a loan originated in Q0 with 100% LTV, 20 years of maturity and a 3% fixed interest rate. Assuming a loan of €100,000 and a property value of €100,000, then indexing the property value subsequently with Fomento's house price index for Spain.

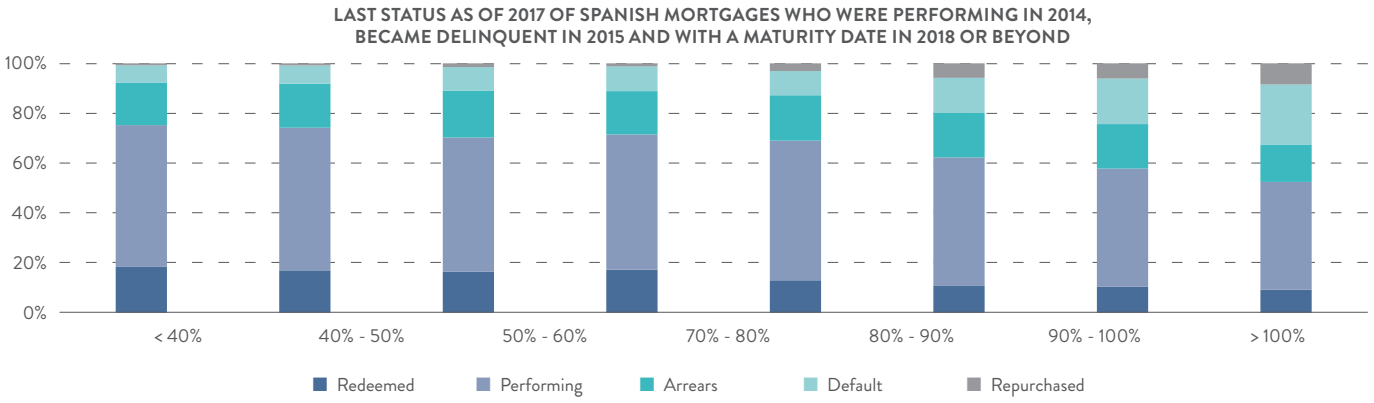
EXHIBIT 3 | BREAKDOWN OF SPANISH RMBS INDEX BY CLTV AND LOAN VINTAGE



Source: European DataWarehouse

[6] It should be noted, that the effects of the crisis were already fading over the course of the period observed.

EXHIBIT 4 | HOW THE CLTV AT THE TIME OF ENTERING ARREARS IN 2015 AFFECTS LOANS IN 2017



Source: European DataWarehouse

As expected, the higher the CLTV of a loan is at the time of becoming delinquent, the more likely it is for this loan to subsequently default or stay delinquent. If about 10% of loans with a CLTV<60% were defaulted or repurchased by Q4 2017, it was the case of about 1/3 of loans with a CLTV exceeding 100%. Conversely, in about 70% of cases, loans with a CLTV <60% that entered delinquency in 2015 had either become reperforming or been redeemed, by Q4 2017, even though they were not due before 2018. For very high LTV loans (more than 90% CLTV), about half were back to performing status or had been redeemed, with few cases of actual redemption. Cases of redemption in Exhibit 4 could be due to a voluntary sale of the property (or other asset) by the borrower to repay the loan, given that these loans were not maturing until 2018. This kind of outcome is substantially rarer for higher CLTV loans. The higher the CLTV, the more likely it is that the loan was repurchased by the originator of the securitisation fund, possibly indicating the use of forbearance measures that were incompatible with the securitisation's documentation (see Appendix 3). This happens for instance when the maturity of the securitised loan extends beyond the final legal maturity of the securitisation fund. Also, loan repurchase by the originator are sometimes also used as a way to minimise reported defaults and support the securitisation fund.

IMPACT OF THE CLTV ON THE FORBEARANCE PROCESS

European regulation encourages lenders to apply reasonable forbearance in favour of their borrowers facing payment difficulties. In particular, the European Central Bank's (ECB) Draft Guidance to Banks on Non-Performing Loans explicitly states *"The key objective of granting forbearance measures is to pave the way for non-performing borrowers to exit their non-performing status, or to prevent performing borrowers from reaching a non-performing status. Forbearance measures should always aim to return the exposure to a situation of sustainable repayment."*[7] It thus lists 14 possible forbearance measures banks can apply as well as their field of application. Forbearance measures mentioned in the ECB's guidance include short term measures such as switch to interest-only, reduced payments, grace period, arrears capitalisation and long-term measures such as interest rate reduction, maturity extension, provision of extra security, sale of the property etc. The application of forbearance measures is normally subject to borrower affordability to ensure that the new debt repayment schedule is sustainable. Forbearance measures, if feasible at no loss for the bank, are typically tried first, whereas forced repossession and sale of the asset are generally used as a last resort to avoid losses for the bank. In this context, forbearance measures can also help preserve client relationships and lender reputations.

The use of forbearance measures is typically constrained by several factors. Essentially, the borrower must be acting in good faith and be willing and able to comply with the newly agreed loan conditions.[8] Borrower cooperation with the lender is thus essential to successfully cure the loan. Finally, the agreement must be viable in the long-term. Banks typically have well defined sets of measures that can be applied in these circumstances, and for a loan with a low CLTV, more can be undertaken, than for a loan with a high CLTV. With borrowers in temporary financial difficulty, for instance due to a life changing event (loss of job/divorce/illness…), short term forbearance measures such as a temporary switch to interest only or a grace period can be appropriate.

Several of the possible forbearance measures depend explicitly on the value of the collateral relatively to the value of the loan. Forbearance options are typically assessed relative to the probable outcome of an asset repossession and sale, where the property value is a direct part of the equation. The higher the CLTV, the greater the probability of suffering a loss. A lower CLTV thus helps gain time for the trial and implementation of forbearance measures such as temporary grace periods and capitalisation of due interest. Of course, the borrower's income and expenses play a key role when it comes to determining the affordability of the new plan, as do the borrowers' ability to extend the loan maturity (it should typically not exceed the date at which the borrower would retire). Also, if the loan has a sufficiently low CLTV, the risk at that stage may have decreased sufficiently to make a lower interest rate acceptable to the lender.

[7] See ECB - Draft Guidance to Banks on Non-Performing Loans; Please refer also to the list of short and long term forbearance measures on pp41-42

[8] Forbearance measures should ideally not benefit "strategic defaulters", who could pay their mortgage obligations but choose not to.

[9] See for instance "European Housing Market Remains Full Recourse Despite Less Restrictive Legal Environment", Moody's Credit Insight, January 2014

[10] See Moody's Credit Insight February 2017 "Recovery rates remain within our assumptions amid weakened repossessed property prices"

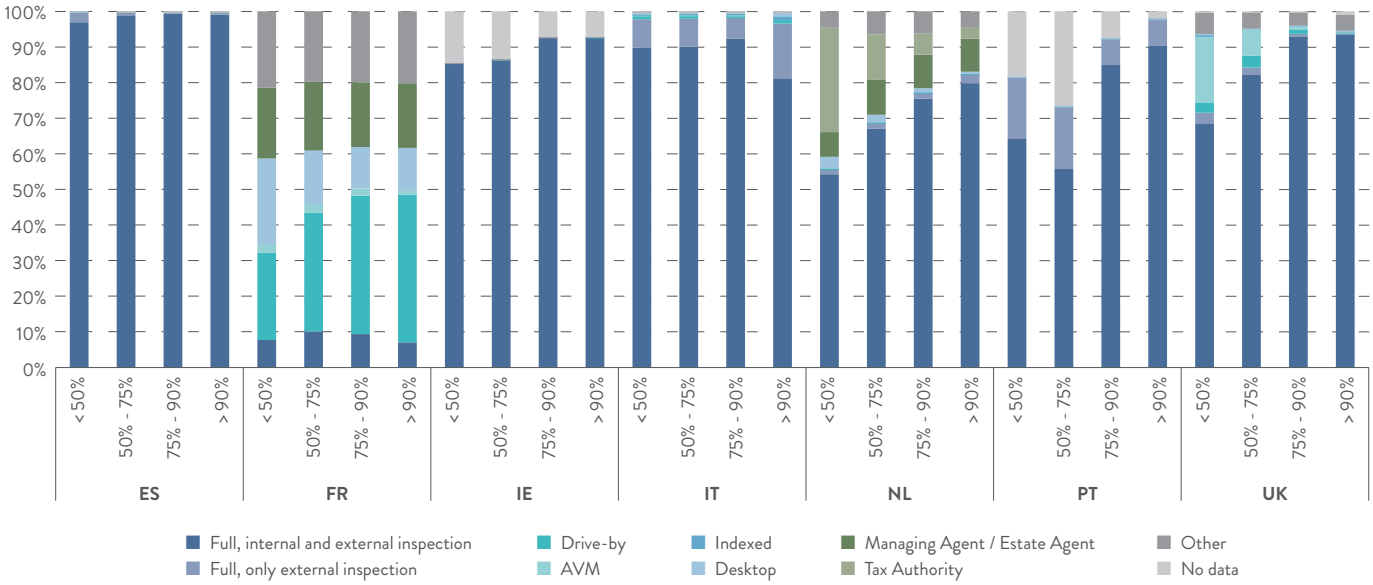
[11] See "The Effects of Principal Reduction on HAMP Early Redefault Rates". Debt forgiveness reduces the payment amount, but also increases the borrower's willingness to pay. A US Treasury study finds that "the behaviour of borrowers who get principal reductions under the Home Affordable Modification Program (HAMP) is much more closely related to their new, reduced loan-to-value (LTV) ratio, than to their before modification (higher) LTV." The same study also finds that a borrower benefitting from a payment reduction through a reduction of negative equity (thus decreasing the CLTV) is less likely to redefault than a borrower having benefitted from the same payment reduction through other means without a reduction of CLTV. The outright Liquidation of an underwater loan is therefore likely to result in a loss for the bank and should be weighed against the interest or principal forgiveness measures as part of a loan restructuring.

When forbearance cannot be granted, the property would be repossessed, sold, and, provided that the CLTV does not exceed a certain percentage, a full recovery with no loss should be expected. If the proceeds of the liquidation are insufficient, final recovery will depend on the amount of the remainder that can be claimed from the borrower. In "full recourse" countries, the borrower should repay the outstanding debt even after liquidation of the asset.[9] A defaulting loan with a high CLTV (i.e. beyond 100%) that would not make a loss in a full recourse country (like the Netherlands), may result in a loss in a non-full recourse country. But even in a full recourse country, it is possible that in a case of severe market disruption, the standards are lowered during the crisis when too many borrowers are affected. On the contrary, in a dislocated real estate market, it is possible that the actual recovery following a forced sale ends up being well below what the indexed property value would suggest.[10] When facing substantial losses, a bank may instead weigh the pros and cons of debt forgiveness (thus taking an up-front loss), to still maximise its recovery, as it may be pointless to repossess a property if there is no one to sell it to.[11]

IMPLICATIONS FOR PROPERTY VALUATIONS

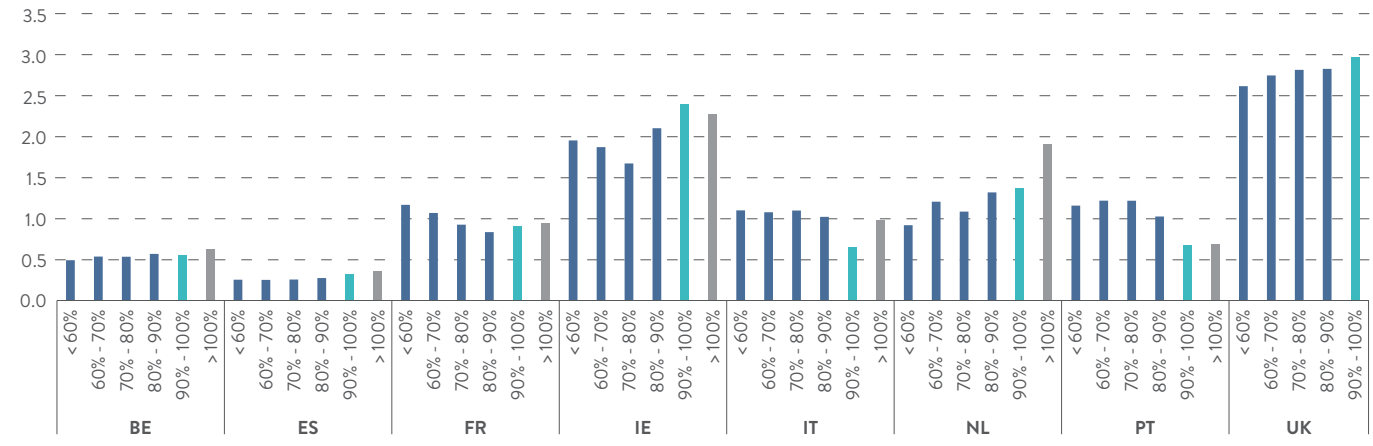
Keeping track of property prices is thus vital to update the CLTV. This can start with a reliable evaluation at loan origination, used as a basis to infer the updated property valuations afterward (i.e. indexing an original value to infer the current value). Exhibit 5 shows that the full inspection, generally considered the most reliable sort of evaluation, is indeed the most used method. It is interesting to note that alternative methods used at loan origination tend to be employed for the loans with the lowest OLTVs, while the full internal and external inspection is the preferred method for the loans with the highest original LTVs.

EXHIBIT 5 | METHOD USED FOR THE VALUATION OF LOANS AT ORIGINATION DEPENDING ON OLTV



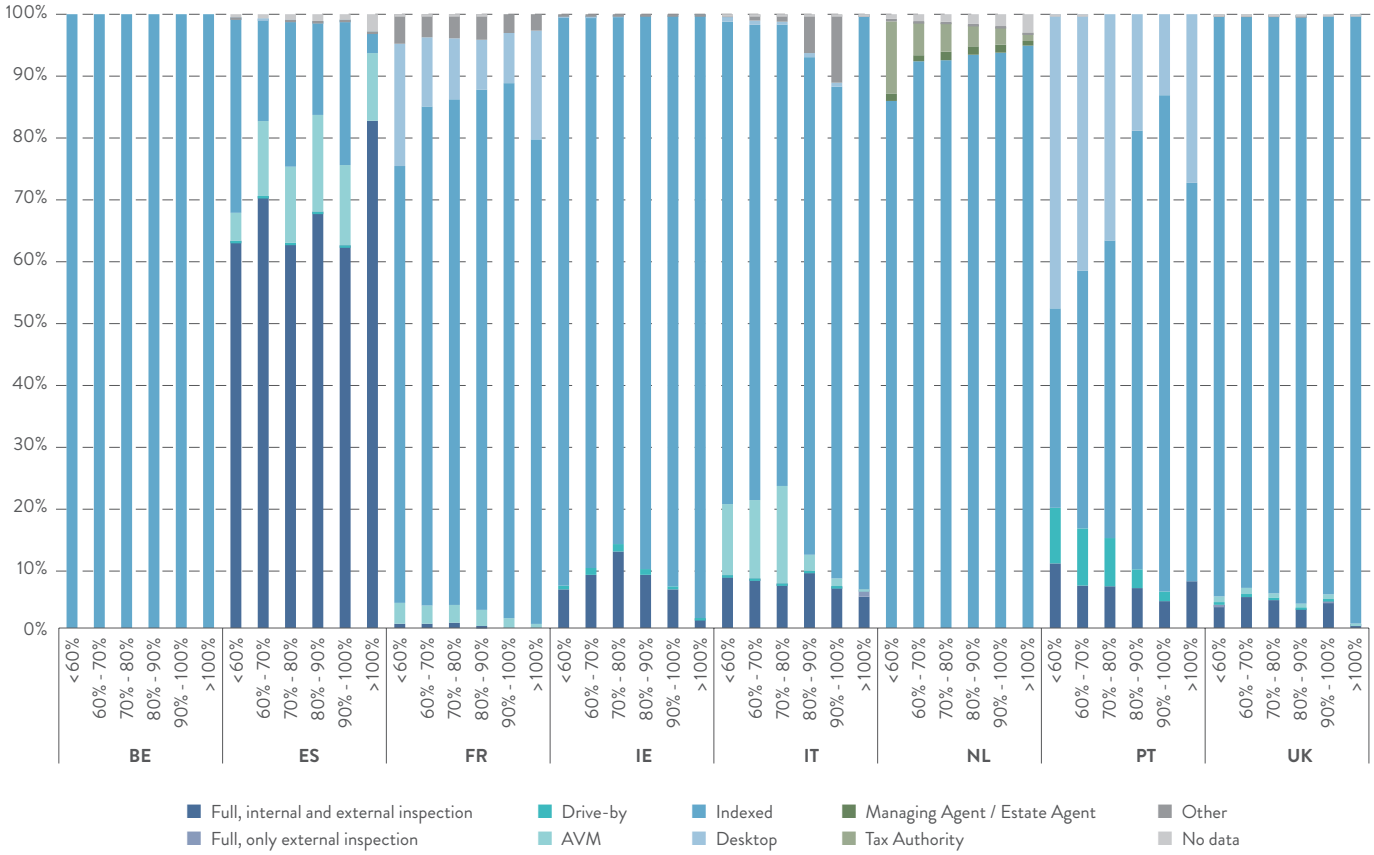
Source: European DataWarehouse

EXHIBIT 6 | REVALUATION FREQUENCY (AVERAGE NUMBER OF VALUATIONS PER YEAR, DEPENDING ON OLTV)



Source: European DataWarehouse

EXHIBIT 7 | REVALUATION METHOD USED DEPENDING ON THE OLTV



Source: European DataWarehouse

Exhibit 6 shows the average number of revaluations we recorded per year per property, depending on the country and the OLTV. In several countries, properties with an OLTV exceeding 90% are indeed revalued more frequently, indicating that these loans are monitored more carefully.

Exhibit 7 shows the revaluation method used depending on the original LTV. Overwhelmingly, indexation is indeed the most frequently used method, probably as it is most cost efficient, although desktop valuations and AVM are also used to a lesser extent. Full reviews are only prevalent in Spain, where the revaluation frequency is also lowest, and in this case indeed, loans with an OLTV above 100% are somewhat more likely to benefit from the full valuation. Otherwise, the level of the OLTV does not seem to influence the choice of method used.

High LTV loans have a well-documented higher default probability and expected loss given default. Nevertheless, most high LTV loans end up repaid in full, and make it possible for buyers with little savings to step onto the property ladder. By now, many countries have enacted LTV ceilings at origination, to limit the risks taken by their banks and citizens when they contract a mortgage. The ability to benefit from forbearance measures mitigates the risks that come with high LTV mortgages, and some buffers should probably be embedded in the loan contracts upfront. Loans that have at the same time a high OLTV, a long maturity, a small margin and other forbearance-like conditions already at origination have little leeway for forbearance in a market downturn. High CLTV loans with little options for forbearance, deserve special scrutiny.

APPENDIX 1: EUROPEAN DATAWAREHOUSE LOAN BY LOAN DATA

Our database records loan by loan data for the securitisations that are repo-eligible with the Eurosystem. The fields available are listed in the ECB's reporting templates.[12] Our mortgage database comprises 15.5 million loans (or loan parts) from 673 RMBS securitisation funds as of July 2018.[13] Thus, the representativeness of the sample is subject to the issuance of securitisations and mirrors some selection bias. Typically, loans included in securitisations funds are all performing on the closing date, and thus tend to show better performance than non-securitised loans, all things being equal. Our data sample is also subject to survivor bias as the loans are those that were still active by the time the data was first reported to us, from 2013 onwards. Loans that would have been liquidated, repaid or refinanced prior to this may, therefore, be excluded. We decided to focus on the markets for which ED has the greatest number and volumes of loans, and limit in time the starting date for the study, starting end 2013, as by that time, data quality had substantially improved. In previous studies, our samples were found

[12] See ECB' Loan Level Data Templates

[13] See European DataWarehouse ABS Market Coverage – July 2018

[14] See European DataWarehouse (ED) introduces new ED Index for Spanish SMEs based on Loan Level Data (May 2016).

to be geographically representative, as for most countries, the proportion of loans in a given region tends to match the importance of that region in the country. For some countries, the influence of very large portfolios must also be taken into account. We based our queries on all the mortgages, regardless of loan purpose.

APPENDIX 2: EUROPEAN DATAWAREHOUSE SPANISH RMBS INDEX

Our upcoming Excel-based Spanish RMBS Index (ED's Index) using Loan Level Data (LLD) will provide a unique overview of Spanish RMBS performance (European DataWarehouse 2017-Q4 – INDEX RMBS SPAIN – MS Excel version). It uses the same method as our Spanish SME Index which was first published in 2016 and has been updated quarterly since.[14] It will therefore differ from existing indices, in that it will group the data based on loan rather than deal-specific characteristics (by loan vintage, loan LTV, region etc.). It will also contain standardised stratification tables and performance measures for our active deals, making benchmarking easier. We show two performance indicators, delinquency 60-90 days and delinquency 90-360 days as a percentage of non-defaulted loans.

The 90-360 days delinquency index is the ratio of the amounts of loans that are at least 3 months (90 days) delinquent but less than one-year (360 days) as a proportion of the current volume of the non-defaulted loans. In general, issuers tend to exclude delinquent loans on the closing date, therefore deals with less than a year of seasoning are excluded from the index calculation, as otherwise, a recently closed deal will always show better performance than a seasoned deal, all things being equal.

Our performance indices show a steady performance improvement for Spanish mortgages since Q1 2014. Due to reporting peculiarities, we adjusted the data to improve comparability, using our experience with data quality work to convert the reported "months in arrears" into "days in arrears". For the sake of transparency, the deal-specific time series used in the calculations will also be displayed along with the index values.

Given the size of our sample (more than 1,000,000 borrowers are represented in the active deals as of Q4 2017), conclusions based on ED's Index are to some extent applicable beyond the securitisation universe. Please note however, that several factors come into play to limit the scope of the conclusions to the broader mortgage markets. Given that loans have a certain seasoning prior to being securitised and given that only performing loans are being securitised at that stage, it follows that some of the worst performing loans are excluded from the securitised pools. We therefore expect securitised loans to perform better than others. One last constraint, is that our database gathers data for all the repo eligible deals for which data was submitted since 2013. Data for non-repo eligible deals is therefore not represented in our sample. There is also a possibility that adverse selection (selecting the worst loans to transfer the risk to the investors) and cherry picking (selecting only the best loans to ensure better than average performance) affect pool composition and performance. ED intends to update this index every quarter and to introduce similar indices for other market segments and jurisdictions.

APPENDIX 3: FORBORNE LOANS IN OUR DATABASE

The prospectuses of the securitisation funds in our database typically have a section regarding the applicable forbearance policies, sometimes mentioning in great detail the acceptable forbearance measures, and specifying what proportion of the loans may be subject to interest rate and maturity modifications, with the applicable constraints on the maturity of the individual loans (which may not exceed the final legal maturity of the securitised portfolios) and the loans' revised interest rates (typically stating that the overall margin for the entire portfolio must remain within a specific range). The proportion of loans subject to forbearance in the portfolios at closing (if any), is also typically mentioned in the prospectus. In our database, a specific field can be used to identify loans benefitting from forbearance arrangements (AR173 "Performance arrangement", optional field), and forborne loans can be identified as loans whose current maturity, or interest rate, or repayment type, are different from those originally stated.