



MODELLING WEEK 2013

IMPACT OF THE SPANISH REAL ESTATE BOOM & CRASH ON THE MORTGAGES RECOVERY INDICATORS

Dynamic econometric modelling of the influence of the sudden rise and devaluation of the housing prices on the loss-given-default (LGD) parameter and its associated capital requirements for Spanish financial institutions

March 2013

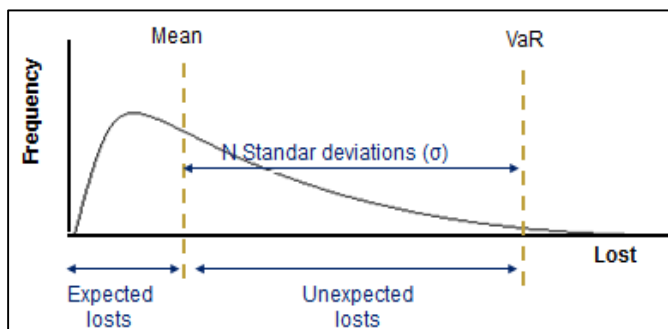
1. Introduction

A bank, like others activities, operates in a framework in which the risk is present. Managing different kinds of risks is a key activity in the banking business. The objective of a bank entity is to maximize revenues and to minimize the risks which are assumed by it.

The banking entities must be able to measure and to manage their risks. Therefore, the risk is positive because it means profitability, but it is necessary to quantify it, as it can cause losses or even lead to bankruptcy.

One of the main risks a bank faces is the **Credit Risk**. The Credit Risk is the loss to which the Entity is exposed in the event the counterpart doesn't make the payments it is obligated to do.

Given a portfolio of contracts, the uncertainty of potential losses associated with it in a time horizon (normally 1 year) is represented by a probability distribution.



Every entity should have sufficient resources to absorb the losses of its activity. These resources are reflected in:

- **Expected losses:** reflect the average amount of losses that is really expected to be lost over a period of time. These are covered by provisions.
- **Unexpected losses:** represent the volatility of the credit losses around the level of expected losses. Each entity determines a statistical confidence level indicating the desired level of capitalization. The resources which must legally be maintained by an Entity to cover the unexpected losses are the **Regulatory Capital**.

For the modeling of such credit losses three main parameters are needed:

- **PD:** Probability of default of a transaction or customer.
- **EAD** (Exposure at Default): Volume risk at the time of default.
- **LGD** (Loss Given Default): **Severity**. The percentage of debt that the bank is unable to recover eventually.

Focusing our attention on the LGD parameter, this is equal to 1 minus the recovery rate. This rate is the percentage of the amount recovered on the EAD.

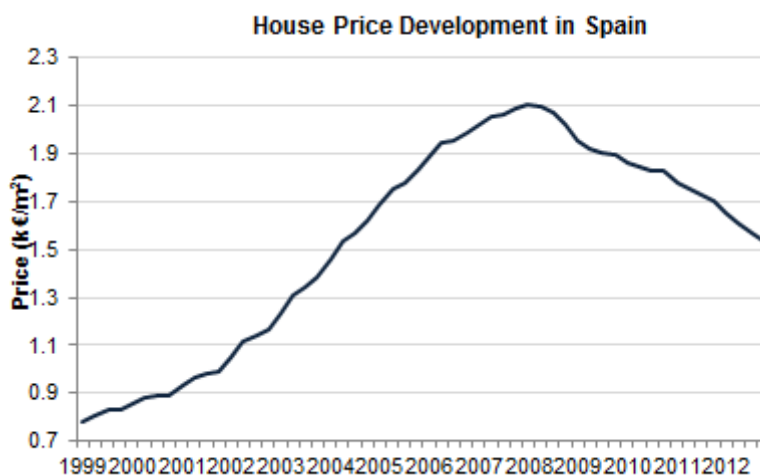
The entity must calculate its own estimated recovery rates internally. Historical data recovery will be necessary to determine the recovery capacity. In this sense we can use either to external or internal data.



As it could be expected, collaterals play an important role during the recovery process. Their initial acquisition and subsequent sale are the main ways to follow in order to mitigate the loss associated to a portfolio. In this sense, there is a natural link between the LGD and the value of financial guarantees. Particularly, in mortgage portfolios, LGD strictly and directly depends on the value of the property that serves as security (by means of LTV).

Thus, in periods characterized by a devaluation of housing prices, LGD increases substantially.

Currently, housing price is the variable that has reflected in a better way the spread of the financial crisis to the real economy, and has been used to explain the depth of the Spanish current crisis. Its evolution and its different trends among the last years show the life cycle of every housing bubble:



So the macroeconomic context is determinant about the final value of LGD.

Our main goal regarding this issue is to calculate the LGD of a mortgage portfolio and to evaluate, through rigorous mathematical modeling, its relationship with the evolution of the housing prices and the future impact of the current crisis in the parameter.

2. Problem to be solved

The tasks to be completed are:

- Calculating the value of the loss-given-default (LGD) parameter for each one of the different segmentation buckets of LTV. The appropriate discount curves to calculate the present flows of data will be used.
- Searching in a public context past historical data and projected housing prices.
- Recalculating the LGD parameter after including this sudden rise and devaluation of the housing prices.

- After that, the differences between first and second LGD values could be discussed.
- Calculating associated capital requirements for Spanish financial institutions.

3. Phases

3.1. Definition of the problem and clarification of doubts

In this first phase, Management Solutions will present the problem in greater detail, providing those ideas that have been developed so far, and will clarify any raising doubts about the understanding of the problem.

Management Solutions will also provide a polished and ready-to-use Excel file, so that the smallest amount of time will be spent on data processing:

- For each of the recovery processes the main information will be:
 - Data about the recovery process (start date, end date, amount spent, amount recovered, etc.)
- Additional information will be used:
 - Discount curves to update the values of the recovery flows

3.2. Phase 1: Calculating LGD parameter

Firstly, given data as the exposure, the amount spent and the amount recovered at the date of the recovery process will be calculated and should be analyzed.

Finally, the value of the loss-given-default (LGD) parameter for each one of the different segmentation buckets of LTV will be calculated. Some discount curves to calculate the present data flows could be used.

3.3. Phase 2: Considering a projected scenario and rebuilding LGD parameter

Using public historical data for housing prices, a new LTV value will be recalculated.

To this purpose, students will rebuild a new LGD parameter considering these new scenarios.

The results obtained in the previous phases could be discussed.

Finally, the capital requirements associated could be calculated.

3.4. Phase 3: Exposition and discussion of results

The case study will conclude with the students' presentation of the used methods and obtained results.