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ACADAMETRICS RESEARCH AND MODEL DEVELOPMENT

BACKGROUND

The Acadameetrics team has extensive experience in modelling risk having undertaken numerous research and model development exercises over the past 18 years. Clients have included mortgage lenders, retail and investment banks and insurers. We note below some early assignments and outline one item of past work in order to indicate our long experience:

- predicting the life of mortgages for securitisations
- predicting (for two large MIG insurers in 1989) that £5 billion of financial sector losses could arise from a housing downturn
- assessing the losses for a very large insurer which would arise from its MIG book
- forecasting, in 1992, the likely MIG losses of a principal MIG insurer until 1997
- forecasting default and the effect on the value of a "for sale" mortgage book
- bringing an econometric dimension to the reserving and capitalisation process for a large MIG insurer during the late 1990s
- assisting a large lender in the pricing of a non-performing loan book which was for sale by assessing the probability of default of mortgages in arrears and the probability of recovery
- forecasting, for a credit score provider, how the "bad rate" might change to take into account macroeconomic factors within credit score models for secured loan, unsecured loan, credit card and mortgage books

In this short paper we provide details of one of these historic exercises.

A FEASIBILITY STUDY INTO FORECASTING POSSESSIONS

During 1998, we investigated how macroeconomic factors influenced the rate of both repossessions and loan defaults defined as those totalling at least six months payments. Whilst this work was undertaken as an Acadameetrics research project at our own expense, designed to enhance our own understanding of future possessions for client discussions, it illustrates a typical client assignment.

Note that, whereas the number of repossessions is a flow (being a number of events occurring in each period), the number of mortgages in arrear is a stock (being the number of mortgages currently in arrear). The number of repossessions increases as borrowers fall into arrear and falls as borrowers recover or are repossessed. The following summarises our internal report.

Data were taken from the Compendium of Housing Finance Statistics 1997 and updated from later issues of CML Housing Finance. Repossessions data were available from 1970-1996 whereas arrears data were available from 1982 onwards.

The analysis considered interest rates, earnings, house prices and unemployment, and the variables used. The results achieved are detailed [here](#).

For **repossessions**, we found that:

- the ratio of house price to average earning was not significant
- the growth of earnings over the past three years was very significant
- a rise in house prices over the previous three years was significant
- the average effective mortgage interest rate over the past one to four years was highly significant
- unemployment at national level was significant

When combining macroeconomic variables, our results showed that the predominant factors were the growth in earnings over the previous three years, and the effective mortgage interest rate over the past one to four years. Adding any further factors such as subsequent growth in house prices made little difference.

For **arrears** we found that:

- the ratio of house prices to earnings three years ago was highly significant
- the ratio of house prices to average earnings three years ago was highly significant
- the growth in earnings over the previous three years was not very significant
- a rise in house prices over the previous three years was significant
- the average effective mortgage rate over the past two to five years was highly significant
- unemployment at national level was not significant

As for repossessions, when we combined macroeconomic variables, we established that growth in earnings over the previous three years and the effective mortgage interest rate over the previous three years were significant. Adding growth in house prices offered an improvement, but other factors made little difference.

As an alternative, we ran similar models that added the most recent stock of arrears as a lagged variable. Combined with macroeconomic variables, we obtained better fits, and concluded that this procedure might prove superior in any future forecasting of possession trends.