

Quantile Regression for Modelling Distributions of Profit and Loss

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Abstract:

Quantile regression is a technique that allows the distribution of continuous quantities to be robustly modelled without explicit assumptions on the form of the distribution. This paper explores two credit risk related applications of this technique:

- Modelling the distribution of expected credit loss from the arrears population of a credit card portfolio. Here we illustrate that the factors that drive “maximum” losses are quite different from those that best estimate the mean loss. An understanding of these effects is used to help improve collections strategies and provisioning estimates.
- Modelling loss given default for secured loans (mortgages) is critically dependant on being able to estimate the likely realisable value of the security (house). Where this is less than the loan amount a loss is realised, however where there is an excess the benefit is passed back to the original account holder. Due to the asymmetric nature of this loss process it is inadequate to use mean house value estimates to estimate mean losses – for many portfolios applying such an approach leads to LGD estimates near 0! A quantile regression model explicitly estimates the distribution of house prices realised and thus leads to realistic and robust estimates suitable for use in Basel II applications.