Abstract

Exposure at Default (EAD) is one of the key credit risk parameters used to calculate capital requirements under the Advanced Internal Rating Based (A-IRB) approach. In order to model the EAD for credit cards and other forms of revolving credit, the Basel II and III Accords propose estimating the Credit Conversion Factor (CCF), i.e. the proportion of the undrawn amount that will be drawn down at default time. Alternatively, more recent work has suggested it may be beneficial to predict the EAD directly, i.e. modelling the balance as a function of a series of risk drivers. In this paper, we propose a novel approach combining two ideas proposed in the literature and test its effectiveness using a large dataset of credit card defaults not previously used in the EAD literature. We estimate EAD by fitting a regression model using the Generalized Additive Models for Location, Scale and Shape (GAMLSS) framework. We then conjecture that the level of EAD as well as the risk drivers of its mean and dispersion parameters could be substantially different between the debtors who hit the credit limit (i.e. "max out" their cards) prior to default and those who do not, and hence implement a mixture model conditioning on these two respective scenarios. Our analysis suggests that current limit is the strongest variable affecting the mean level of EAD. Current balance, previous paid payment percentage, dummy variable indicating non-negative balance, behavioural score and credit utilization (present balance over limit) could also be used in predicting EAD mean level. In terms of risk controlling, one should focus on the current level of drawn balance amount and (estimated) time to default as their values greatly impact the dispersion of EAD. In addition to identifying the most important variables, our analysis suggests that predictive accuracy is improved by incorporating non-linear effects, but we do not find further value in adding the mixture component.