

Segmentation, Probability of Default and Basel II Capital Measures for Credit Card Portfolios

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Abstract:

This paper examines alternative methods for differentiating the likelihood of default among credit card borrowers and how these alternative methods affect capital requirements for the portfolio when using a variant of the Vasicek (2002) asymptotic single risk factor (ASRF) model to construct a value-at-risk (VAR) capital measure.

The results in our paper have important implications for banking practice. First, the general modeling approach discussed in the paper is an approach commonly used in the banking industry (see Risk Management Association, 2003). Moreover, this modeling framework is embodied in the proposed Basel II regulatory framework for bank capital.

In the ASRF model, accurate estimates of the tail of the portfolio distribution require differentiating the portfolio into separate “homogeneous” risk buckets. Credit card risk managers often refer to these differentiated risk buckets as “segments.” While there are some important differences between credit card and commercial loan portfolios, the segmentation process for the consumer portfolio is in many ways analogous to the loan rating process commonly used for estimating loss distributions of a commercial lending portfolio (see Treacy and Carey, 1998).

We show that the estimates of VARs obtained from the ASRF model are inversely related to the degree of homogeneity of the portfolio segments. Other things equal, a finer differentiation of default risk among borrowers produces a more accurate and lower estimated VAR.

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