# Biased Sampling: Solution for Lower Incidence Rate

M Muthu Mangai

Copyright 2008 by the Society of Actuaries.
All rights reserved by the Society of Actuaries. Permission is granted to make brief excerpts for a published review. Permission is also granted to make limited numbers of copies of items in this monograph for personal, internal, classroom or other instructional use, on condition that the foregoing copyright notice is used so as to give reasonable notice of the Society's copyright. This consent for free limited copying without prior consent of the Society does not extend to making copies for general distribution, for advertising or promotional purposes, for inclusion in new collective works or for resale.

## Abstract

Given the lower incidence rate, use of decision tree techniques like Classification and Regression Tree (CART) in understanding credit or operational risk becomes quite challenging. A commonly adopted solution is biased sampling approach, where more weights are attached to bad customers to artificially hike the incidence or bad rate. While adopting this type of biased sampling approach, question of the best weight arises. This paper adopts an iterative approach in identifying the best weight. The best weight for bankruptcy (BKO) profiling problem in hand occurred when the incidence rate was around 50 percent where entropy reaches its maximum.