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Title:

Insurance applications of the 0-1-inflated beta distributions

Abstract:

An insured asset may, in some time interval or during some event, suffer no loss, complete loss, or partial loss. Modelling the outcome for each policy as a loss ratio, defined as the claim paid over the sum insured, results in observations distributed on the closed unit interval, with point masses of probability at zero and one.

Here I present two case studies of insurance data that rely on the zero-one-inflated beta distribution. First, I describe a wind vulnerability model that is fit using Insurance Australia Group's claims experience from recent cyclones in Northern Queensland. Second, I present an analysis of residential claims arising from a pair of natural disasters that affected the same region in quick succession. Here, the zero-one-inflated beta distribution is used to apportion the fraction of loss, at the policy level, that is attributable to the first event, conditional on observable covariates.