MACQUARIE UNIVERSITY
DEPARTMENT OF MATHEMATICS AND STATISTICS
STATISTICS SEMINAR SERIES

Speaker: Dr Francis K.C. Hui, Research School of Finance, Actuarial Studies & Statistics, Australian National University
Date: 14 May 2019
Time: 1pm-2pm
Venue: 14 SCO Avenue, Access Grid Room 146

Title: A Shared Parameter Mixture Model for Longitudinal Income Data with Missing Responses and Zero Rounding

Abstract:

The analysis of longitudinal income data is often made challenging for several reasons. For example, this research was motivated by income data collected annually as part of the Household Income and Labour Dynamics in Australia (HILDA) survey, in which we find that a non-negligible proportion of responses are missing, and it is believed some of this nonresponse is missing not at random. Furthermore, there are a substantial number of reported zero incomes, and while some of these may be true zeros (corresponding to individuals who truly do not earn an income), some may be false zeros (corresponding to individuals rounding their income to zero). We propose a shared parameter mixture (SPM) model for analyzing such semicontinuous longitudinal income data, which explicitly addresses the two challenges of income nonresponse and zero rounding. This is accomplished by jointly modeling an individual's underlying income together with the probability of nonresponse and rounding to zero, where both probabilities are permitted to vary in a smooth manner with their underlying, non-zero income. Applying the SPM model to the HILDA survey reveals that on average, older female individuals and individuals with a health condition are considerably less likely to earn an income, while annual income tends to be highest for male individuals on fixed-term or permanent job contracts between ages 55 to 60. Furthermore, there is evidence of both zero rounding and income dependent missingness.

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