

Title : On a multivariate renewal-reward process involving delays: Applications to IBNR process and infinite server queues

Abstract : We consider a renewal-reward process with multivariate discounted rewards (inputs) where the arrival epochs are adjusted by adding some random delays. Then this accumulated reward can be regarded as a multivariate discounted "Incurred But Not Reported" (IBNR) claims in actuarial science and some important quantities studied in queueing theory such as the number of customers in $G/G/\infty$ queues with correlated batch arrivals. We study the long-term behavior of this process as well as its moments. Asymptotic expressions and bounds for the quantities of our interest, and also convergence result for the distribution of this process after renormalization, are studied. Next, assuming a combination of exponentials or exponential service times in infinite server queues with renewal arrival process, we derive some explicit and numerically feasible expressions for the limiting joint moments and for the limiting expectation of workload, and the covariance of queue size and workload. This is joint work with Landy Rabehasaina.