

# A method of staffing large call centers based on stochastic fluid models

J. Michael Harrison  
*Graduate School of Business*  
*Stanford University*  
*Stanford, CA 94305-5015, USA*

## **Abstract**

We consider a call center model with  $m$  input flows and  $r$  pools of agents; the  $m$ -vector  $\lambda$  of instantaneous arrival rates is allowed to be time-dependent and to vary stochastically. Seeking to optimize the trade-off between personnel costs and abandonment penalties, we develop and illustrate a practical method for sizing the  $r$  agent pools. Using stochastic fluid models, this method reduces the staffing problem to a multi-dimensional newsvendor problem, which can be solved numerically by a combination of linear programming and Monte Carlo simulation. Numerical examples are presented, and in all cases the pool sizes derived by means of the proposed method are very close to optimal.

*Joint work with Assaf Zeevi of Columbia University*