Seminario de Ecuaciones Diferenciales y Análisis Numérico
Universidad de Buenos Aires - Argentina
21 de Agosto de 2018
Ciudad Universitaria - Pabellón I
Departamento de Matemática
Segundo Piso - Sala de Conferencias del DM-IMAS, 14:00.

Optimal stochastic control on cash management.

PABLO AZCUE*

In this presentation, we deal with a continuous time cash management problem where the uncontrolled money stock follows a compound Poisson process with two-sided jumps and negative drift; this drift corresponds to the daily money demand, and the negative and positive jumps correspond to outflows or inflows that occur in a very short time at random epochs. The money manager continuously monitors the cash flow and at any time he/she can increase or decrease the amount of cash to prevent the excess and shortage. We assume that the controlled money stock cannot be negative. The main goal is to minimize the total expected discounted sum of the opportunity cost of holding cash and the adjustment cost coming from deposits and withdrawals. The adjustment cost has a positive fixed component and also can have a proportional one; the fixed component cost leads to an impulse control problem. We show that the optimal value function is a viscosity solution of the corresponding Hamilton–Jacobi–Bellman equation and that it can be characterized as the largest viscosity supersolution. This HJB equation is a nonlinear integro-differential equation which can be solved explicitly in some cases. We also see that the optimal policy has an impulse multi-band structure with (possible) multiple trigger-target pairs.

*Universidad Torcuato Di Tella - Argentina. email: pazcue@utdt.edu Homepage: https://www.utdt.edu/ver_contenido.php?id_contenido=13441&id_item_menu=23820