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A spectral method for an Optimal Investment problem with Transaction Costs under Potential Utility*

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Abstract

This paper concerns the numerical solution of the finite-horizon Optimal Investment problem with transaction costs under Potential Utility. The problem is initially posed in terms of an evolutive HJB equation with gradient constraints. In [12], the problem is reformulated as a non-linear parabolic double obstacle problem posed in one spatial variable and defined in an unbounded domain where several explicit properties and formulas are obtained. The restatement of the problem in polar coordinates allows to pose the problem in one spatial variable in a finite domain, avoiding some of the technical difficulties of the numerical solution of the previous statement of the problem. If high precision is required, the spectral numerical method proposed becomes more efficient than simpler methods as finite differences for example.

Keywords: Optimal Investment, Potential Utility, Transaction costs, Spectral method.

1 Introduction

This paper concerns with the numerical solution of the finite horizon optimal investment problem with transaction costs under Potential Utility.

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