To: WBF Finite Difference Course Participants
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St: Level 1
Dt: 10 May 2023

Agenda

The course is primarily built around the article 'Fun with Finite Difference'. It makes good sense to read the article before start of the course.

We provide supplementary material 'Finite Difference Method for Financial Problems 0-4' for the reader who likes a deeper dive.

On level 1 we will start by going through the theory of the theta solver and how it is coded.

We will then actually code it, fire it up and do some basic tests.

To Do

1/ Code methods kFiniteDifference::dx() and ::dxx() that compute the operators $\delta_x^+, \delta_x^-, \delta_x, \delta_{xx}$ as compact tridiagonal matrixes.

2/ Code kFd1d::calcAx(), that computes the operator $I + \theta \Delta t \bar{A}$ as a tridiagonal matrix.

3/ Code kMatrixAlgebra::tridag(). Use NRC::tridag() as inspiration.

4/ Code kMatrixAlgebra::banmul(). Don't use NRC:banmul() as inspiration.

5/ Code kFd1d::rollBwd().

6/ Code kFd1d::rollFwd().

7/ Hook to Excel by filling the function xFd1d().

8/ Test duality for the backward and forward solution from Excel.