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   Help
#if defined(PremiaCurrentVersion) && PremiaCurrentVersion <
     (2007+2) //The "#else" part of the code will be freely av
    ailable after the (year of creation of this file + 2)
#else

#ifndef CIRpp1DTREE_H_INCLUDED
#define CIRpp1DTREE_H_INCLUDED

#include "pnl/pnl_vector.h"
#include "math/read_market_zc/InitialYieldCurve.h"

///******************TreeCIRpp1D structure***************
    **///
typedef struct TreeCIRpp1D
{
  double Tf;            // Final time of the tree, dt=Tf/Ng
    rid
  int Ngrid;            // Number of time step in the TreeC
    IRpp1D

  double delta_x;
  double bb;

  PnlVect* t;           // Time step grid, from t[0] to T[
    Ngrid].
  PnlVect* Xmax;
  PnlVect* Xmin;
  PnlVect* alpha;       // Translation from x to r. ( r_t =
     x_t + alpha_t)
}TreeCIRpp1D;

///************* Datas specific to Hull and White *********
    *****///
typedef struct ModelCIRpp1D
{
    double MeanReversion;                    /*Speed rev
    ertion of the Hullwhite model.*/
    double Volatility;                    /*Volatility of
    the Hullwhite model.*/
    double LongTermMean;
```

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    double Initialx0;
}ModelCIRpp1D;

///******** Fonctions relatives a la construction de l'arbr
    e ********///

int SetTimegridCapCIRpp1D(TreeCIRpp1D *Meth, int NtY,
    double current_date, double T0, double S0, double periodicity);
//Construction of the time grid

int SetTimegridZCbondCIRpp1D(TreeCIRpp1D *Meth, int n,
    double current_date, double T, double S);
// Construction of the time grid

int SetTimegridCIRpp1D(TreeCIRpp1D *Meth, int n, double
    current_date, double T);

double x_value(int i, int h, TreeCIRpp1D *Meth);

double R(double x, double sigma);

double MiddleNode(TreeCIRpp1D *Meth, int i, double a,
    double b, double sigma, double current_x, double sqrt_delta_t,
    PnlVect* Probas);

void SetTreeCIRpp1D(TreeCIRpp1D* Meth, ModelCIRpp1D* ModelP
    aram, ZCMarketData* ZCMarket); // Construction of the tree
    (Jminimum, Jmaximum, alpha)

int indiceTimeCIRpp1D(TreeCIRpp1D *Meth, double s); // t[
    indiceTimeCIRpp1D(s)]< s <= t[indiceTimeCIRpp1D(s) + 1]

int DeleteTimegridCIRpp1D(struct TreeCIRpp1D *Meth); // De
    lete the PnlVect t
int DeleteTreeCIRpp1D(struct TreeCIRpp1D* Meth); // Delete
    the PnlVect Jminimum, Jmaximum, alpha

#endif // HW2DTREE_H_INCLUDED
#endif //PremiaCurrentVersion
```

References