

## Help

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#if defined(PremiaCurrentVersion) && PremiaCurrentVersion <
    (2010+2) //The "#else" part of the code will be freely available after the (year of creation of this file + 2)
#else

#ifndef TreeHW1dGeneralized_H_INCLUDED
#define TreeHW1dGeneralized_H_INCLUDED
#include "math/read_market_zc/InitialYieldCurve.h"

//*****TreeHW1dG structure*****
//
typedef struct TreeHW1dG
{
    double Tf;           // Final time of the tree, dt=Tf/Ng
    int rid;
    int Ngrid;           // Number of time step in the TreeHW1dG

    PnlVect *t;          // Time step grid, from t[0] to T[Ngrid].
    PnlVectInt *Jminimum; // Jminimum[i] : Minimal index at time i
    PnlVectInt *Jmaximum; // Jmaximum[i] : Maximal index at time i
    PnlVect *alpha;       // Translation from x to r. ( r_t = x_t + alpha_t)
} TreeHW1dG;

//***** Datas specific to Hull and White *****
//
typedef struct ModelHW1dG
{
    double MeanReversion; //Speed reversion of the Hullwhite model.*/

    PnlVect *TimeGrid;
    PnlVect *ShortRateVolGrid; /*Volatility of the Hullwhite model.*/

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} ModelHW1dG;

double Current_VolatilityHW1dG(ModelHW1dG *HW1dG, double t)
    ;

void SetTreeHW1dG(TreeHW1dG *Meth, ModelHW1dG *ModelParam,
    ZCMarketData *ZCMarket);

int SetTimeGridHW1dG(TreeHW1dG *Meth, int NbrTimeStep,
    double T1, double T2);

int SetTimeGrid_TenorHW1dG(TreeHW1dG *Meth, int NtY,
    double T0, double S0, double periodicity);

void BackwardIterationHW1dG(TreeHW1dG *Meth, ModelHW1dG *
    ModelParam, PnlVect *OptionPriceVect1, PnlVect *OptionPriceVec
    t2, int index_last, int index_first);

double SpaceStepHW1dG(double delta_t, double sigma); // Ren
    voie Delta_x(i)

double ProbaUpHW1dG(int j, int k, double delta_t2, double
    beta_x, double mean_reversion); // beta_x = deltax1/deltax2

double ProbaMiddleHW1dG(int j, int k, double delta_t2,
    double beta_x, double mean_reversion);

double ProbaDownHW1dG(int j, int k, double delta_t2,
    double beta_x, double mean_reversion);

int IndexTimeHW1dG(TreeHW1dG *Meth, double s); // To locat
    e the date s inf the tree.

int DeleteTimegridHW1dG(struct TreeHW1dG *Meth);

int DeleteTreeHW1dG(struct TreeHW1dG *Meth);

int DeletModelHW1dG(struct ModelHW1dG *HW1dG);

```

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#endif // TreeHW1dGeneralized_H_INCLUDED
#endif //PremiaCurrentVersion
```

## References