

[Help](#)

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extern "C" {
#include "nig1d_std.h"
#include "enums.h"
}
#include "math/levy_fd.h"
extern "C" {

#ifdef PremiaCurrentVersion && PremiaCurrentVersion < (2007+2) //The "#else"
static int CHK_OPT(FD_ImpExp)(void *Opt, void *Mod)
{
    return NONACTIVE;
}
int CALC(FD_ImpExp)(void *Opt, void *Mod, PricingMethod *Met)
{
    return AVAILABLE_IN_FULL_PREMIA;
}
#else

static int ImpExp(int am, double S0, NumFunc_1 *p, double T, double r, double

{

    double price0, delta0;
    int flag_callput, flag_stdbarrier;
    double rebate = 0.;

    /*Construction of the model*/
    NIG_measure measure(theta, sigma, kappa, dx);

    double K = p->Par[0].Val.V_DOUBLE;

    /*Localization on a bounded computational domain (-A1,Ar)*/
    double k = 3;
    double A1 = log(2. / 3) + T * measure.espX1 - k * sqrt(T * measure.varX1);
    double Ar = log(2.) + r * T + k * sqrt(T * measure.varX1);
    if (A1 < -30) A1 = -30;
    if (Ar > 30) Ar = 30;
    int N1 = (int)ceil(-A1 / dx);
    int Nr = (int)ceil(Ar / dx);
    int N = N1 + Nr;

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    Al = -Nl * dx;
    Ar = Nr * dx;

    if ((p->Compute) == &Put)
        flag_callput = 2;
    else /*if ((p->Compute)==&Call)*/
        flag_callput = 1;

    flag_stdbarrier = 1;

    /*Price Computation*/
    if (flag_scheme == 1)
        vector<double> u = price2(am, measure, flag_callput, flag_stdbarrier, r, d
    else
        vector<double> u = price2c(am, measure, flag_callput, flag_stdbarrier, r,

    /*Price */
    *ptprice = price0;

    /*Delta */
    *ptdelta = delta0;

    return OK;
}

int CALC(FD_ImpExp)(void *Opt, void *Mod, PricingMethod *Met)
{
    TYPEOPT *ptOpt = (TYPEOPT *)Opt;
    TYPEMOD *ptMod = (TYPEMOD *)Mod;
    double r, divid;

    r = log(1. + ptMod->R.Val.V_DOUBLE / 100.);
    divid = log(1. + ptMod->Divid.Val.V_DOUBLE / 100.);

    return ImpExp(ptOpt->EuOrAm.Val.V_BOOL, ptMod->S0.Val.V_PDOUBLE,
                  ptOpt->PayOff.Val.V_NUMFUNC_1, ptOpt->Maturity.Val.V_DATE - pt
}

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static int CHK_OPT(FD_ImpExp)(void *Opt, void *Mod)
{
    if ((strcmp(((Option *)Opt)->Name, "CallEuro") == 0) || (strcmp(((Option *)Opt)->Name, "PutEuro") == 0))
    {
        return OK;
    }
    return WRONG;
}
#endif //PremiaCurrentVersion

static int MET(Init)(PricingMethod *Met, Option *Opt)
{
    static int first = 1;

    if (first)
    {
        Met->HelpFilenameHint = "FD_ImpExp_Nig";
        Met->Par[0].Val.V_PDOUBLE = 0.001;
        Met->Par[1].Val.V_INT2 = 400;
        Met->Par[2].Val.V_ENUM.value = 1;
        Met->Par[2].Val.V_ENUM.members = &PremiaEnumExpPart;
        first = 0;
    }

    return OK;
}

PricingMethod MET(FD_ImpExp) =
{
    "FD_ImpExp",
    { {"Space Discretization Step", DOUBLE, {500}, ALLOW}, {"TimeStepNumber", INT, {100}, ALLOW}, {"Explicit Part", ENUM, {100}, ALLOW}, {" ", PREMIA_NULLTYPE, {0}, FORBID} },
    CALC(FD_ImpExp),
    { {"Price", DOUBLE, {100}, FORBID}, {"Delta", DOUBLE, {100}, FORBID}, {" ", PREMIA_NULLTYPE, {0}, FORBID} },
    CHK_OPT(FD_ImpExp),
    CHK_split,
    MET(Init),
}

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    0, "fd_impexp_nig",  
};  
}
```