

[Help](#)

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#include "
href../../mod/bsdisdiv1d/bsdisdiv1d_h_src.pdfbsdisdiv1d.h"
#include "
href../../common/chk_h_src.pdfchk.h"
#include "
href../../common/error_msg_h_src.pdferror_msg.h"
#include "
href../../mod/hes1d/hes1d_pad/model_h_src.pdfmodel.h"
#include "pnl/pnl_matrix.h"

extern char *path_sep;

static int adjust_vector_size(VAR *x, int size, double default_value)
{
    PnlVect *v = x->Val.V_PNLVECT;

    if (v == NULL)
    {
        if ((x->Val.V_PNLVECT =
            pnl_vect_create_from_double(size, default_value)) == NULL)
            return MEMORY_ALLOCATION_FAILURE;
        else
            return OK;
    }

    if (v->size == size) return OK;
    return pnl_vect_resize_from_double(v, size, default_value);
}

static void set_Nb_Divid(void *model)
{
    TYPEMOD *pt = (TYPEMOD *) (model);

    adjust_vector_size(&(pt->Amounts), pt->Size.Val.V_PINT, 3.);
    adjust_vector_size(&(pt->Dates), pt->Size.Val.V_PINT, 0.5);
}

static int MOD(Init)(Model *model)
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{
    TYPEMOD *pt = (TYPEMOD *) (model->TypeModel);

    if (model->init == 0)
    {

        model->init = 1;
        model->nvar = 0;
        pt->T.Vname = "Current Date";
        pt->T.Vtype = DATE;
        pt->T.Val.V_DATE = 0.;
        pt->T.Viter = ALLOW;
        model->nvar++;

        pt->Size.Vname = "Number of Discrete Dividends";
        pt->Size.Vtype = PINT;
        pt->Size.Val.V_PINT = 1;
        pt->Size.setter = set_Nb_Divid;
        pt->Size.Viter = FORBID;
        model->nvar++;

        pt->S0.Vname = "Spot";
        pt->S0.Vtype = PDOUBLE;
        pt->S0.Val.V_PDOUBLE = 100.;
        pt->S0.Viter = ALLOW;
        model->nvar++;

        pt->Mu.Vname = "Trend";
        pt->Mu.Vtype = DOUBLE;
        pt->Mu.Val.V_DOUBLE = 0.;
        pt->Mu.Viter = ALLOW;
        model->nvar++;

        pt->Sigma.Vname = "Volatility";
        pt->Sigma.Vtype = PDOUBLE;
        pt->Sigma.Val.V_PDOUBLE = 0.2;
        pt->Sigma.Viter = ALLOW;
        model->nvar++;

        pt->R.Vname = "Annual Interest Rate";
        pt->R.Vtype = DOUBLE;
    }
}

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    pt->R.Val.V_DOUBLE = 10.;
    pt->R.Viter = ALLOW;
    model->nvar++;

    pt->Amounts.Vname = "Dividend Amounts";
    pt->Amounts.Vtype = PNLVECT;
    pt->Amounts.Val.V_PNLVECT = NULL;
    pt->Amounts.Viter = FORBID;
    model->nvar++;

    pt->Dates.Vname = "Dividend Dates";
    pt->Dates.Vtype = PNLVECT;
    pt->Dates.Val.V_PNLVECT = NULL;
    pt->Dates.Viter = FORBID;
    model->nvar++;
}

adjust_vector_size(&(pt->Amounts), pt->Size.Val.V_PINT, 3.);
adjust_vector_size(&(pt->Dates), pt->Size.Val.V_PINT, 0.5);
return OK;
}

TYPEMOD BlackScholesDisDiv1dim;
MAKEMOD(BlackScholesDisDiv1dim);

```