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```
#include "qtsm2d.h"
#include "chk.h"
#include "error_msg.h"
#include "model.h"
#include "pnl/pnl_vector.h"
#include "pnl/pnl_matrix.h"

extern char *path_sep;

static int MOD(Init)(Model *model)
{
    TYPEMOD *pt = (TYPEMOD *) (model->TypeModel);
    double tmp1[3], tmp2[4];
    double tmp[2];

    if (model->init == 0)
    {
        model->init = 1;
        model->nvar = 0;

        pt->T.Vname = "Current Date";
        pt->T.Vtype = DATE;
        pt->T.Val.V_DATE = 0.0;
        pt->T.Viter = ALLOW;
        model->nvar++;

        pt->x.Vname = "Initial x";
        pt->x.Vtype = PNLVECT;

        tmp[0] = 0.735;
        tmp[1] = -0.525;
        pt->x.Val.V_PNLVECT = pnl_vect_create_from_ptr(2, tmp);
        pt->x.Viter = FORBID;
        model->nvar++;

        pt->d0.Vname = "d0";
        pt->d0.Vtype = PDOUBLE;
        pt->d0.Val.V_PDOUBLE = 0.0088;
        pt->d0.Viter = ALLOW;
```

```
model->nvar++;

pt->d.Vname = "Initial d";
pt->d.Vtype = PNLVECT;
tmp[0] = 0.0066;
tmp[1] = -0.022;
pt->d.Val.V_PNLVECT = pnl_vect_create_from_ptr(2, tmp);
pt->d.Viter = FORBID;
model->nvar++;

pt->theta.Vname = "Theta";
pt->theta.Vtype = PNLVECT;
tmp[0] = 0.;
tmp[1] = 0.;
pt->theta.Val.V_PNLVECT = pnl_vect_create_from_ptr(2, tmp);
pt->theta.Viter = FORBID;
model->nvar++;

pt->GammaV.Vname = "Gamma11 Gamma12 Gamma22";
pt->GammaV.Vtype = PNLVECT;
tmp1[0] = 0.0176;
tmp1[1] = -0.0132;
tmp1[2] = 0.1100;
pt->GammaV.Val.V_PNLVECT = pnl_vect_create_from_ptr(3, tmp1);
pt->GammaV.Viter = FORBID;
model->nvar++;

pt->SigmaV.Vname = "Sigma11 Sigma12 Sigma22";
pt->SigmaV.Vtype = PNLVECT;
tmp1[0] = 1.;
tmp1[1] = 0.;
tmp1[2] = 1.;
pt->SigmaV.Val.V_PNLVECT = pnl_vect_create_from_ptr(3, tmp1);
pt->SigmaV.Viter = FORBID;
model->nvar++;

pt->KappaV.Vname = "Kappa11 Kappa12 Kappa21 Kappa22";
pt->KappaV.Vtype = PNLVECT;
```

```
    tmp2[0] = 0.264;
    tmp2[1] = 0.;
    tmp2[2] = 0.1;
    tmp2[3] = 0.66;
    pt->KappaV.Val.V_PNLVECT = pnl_vect_create_from_ptr(4, tmp2);
    pt->KappaV.Viter = FORBID;
    model->nvar++;

}
return OK;

}
TYPEMOD QTSM2d;
MAKEMOD(QTSM2d);
```