

```
#include "exoi.h"
static NumFunc_1 call =
{
    Call,
    {"Strike", PDOUBLE, {100}, FORBID, UNSETABLE}, {" ", PREMIA_NULLTYPE, {0}, FORBID, UNSETABLE},
    CHK_call
};

static TYPEOPT CallableCMSSpread =
{
    {"Payoff", NUMFUNC_1, {0}, FORBID, SETABLE}, /* PayOff; */
    {"First Exercise Date", DATE, {0}, ALLOW, SETABLE}, /* FirstExerciseDate;*/
    {"Last Payment Date", DATE, {0}, ALLOW, SETABLE}, /* LastPaymentDate;*/
    {"Reset Period", PDOUBLE, {0}, ALLOW, SETABLE}, /* Reset Period;*/
    {"Nominal Value", PDOUBLE, {0}, ALLOW, SETABLE}, /* Nominal;*/
    {"Spread Rate", PDOUBLE, {0}, ALLOW, UNSETABLE}, /* Spread Rate;*/
    {"Cap Rate", PDOUBLE, {0}, ALLOW, SETABLE}, /* Cap Rate;*/
    {"Strike", PDOUBLE, {0}, ALLOW, UNSETABLE}, /* Strike;*/
    {"Gearing", PDOUBLE, {0}, ALLOW, UNSETABLE}, /* Gearing;*/
    {"Floor Rate", PDOUBLE, {0}, ALLOW, SETABLE}, /* Floor;*/
    {"Fixed Rate", PDOUBLE, {0}, ALLOW, UNSETABLE}, /* FixedRate;*/
    {"Lower Range Bound", PDOUBLE, {0}, ALLOW, UNSETABLE}, /* LowerRangeBound;*/
    {"Upper Range Bound", PDOUBLE, {0}, ALLOW, UNSETABLE}, /* UpperRangeBound;*/
    {"CMS1 Maturity", PDOUBLE, {0}, ALLOW, SETABLE}, /* CMSMat1;*/
    {"CMS2 Maturity", PDOUBLE, {0}, ALLOW, SETABLE}, /* CMSMat2;*/
};

static int OPT(Init)(Option *opt, Model *mod)
{
    TYPEOPT *pt = (TYPEOPT *) (opt->TypeOpt);

    if (opt->init == 0)
    {
        opt->init = 1;
        opt->nvar = 15;
        opt->nvar_setable = 9;

        pt->PayOff.Val.V_NUMFUNC_1 = &call;
        (pt->FirstExerciseDate).Val.V DATE = 1.0;
    }
}
```

```
(pt->LastPaymentDate).Val.V_DATE = 10.0;
(pt->ResetPeriod).Val.V_PDDOUBLE = 1.0;
(pt->Nominal).Val.V_PDDOUBLE = 10000.0;
(pt->Spread).Val.V_PDDOUBLE = 0.05;
(pt->Cap).Val.V_PDDOUBLE = 0.06;
(pt->Strike).Val.V_PDDOUBLE = 0.12;
(pt->Gearing).Val.V_PDDOUBLE = 2.;
(pt->Floor).Val.V_PDDOUBLE = 0.;
(pt->FixedRate).Val.V_PDDOUBLE = 0.07;
(pt->LowerRangeBound).Val.V_PDDOUBLE = 0.;
(pt->UpperRangeBound).Val.V_PDDOUBLE = 0.045;
(pt->CMSMat1).Val.V_PDDOUBLE = 10;
(pt->CMSMat2).Val.V_PDDOUBLE = 2;
}

return OK;
}

MAKEOPT(CallableCMSSpread);
```