```
        TABHL   - A FUNCTION WITH VALUES SPECIFIED BY A TABLE
        CMIT    - CMI TABLE
        IOPC    - INDUSTRIAL OUTPUT PER CAPITA (DOLLARS/
                  PERSON-YEAR)


LMC.K=1-(CMI.K*FPU.K)                                          28, A
    LMC     - LIFETIME MULTIPLIER FROM CROWDING
              (DIMENSIONLESS)
    CMI     - CROWDING MULTIPLIER FROM INDUSTRIALIZATION
              (DIMENSIONLESS)
    FPU     - FRACTION OF POPULATION URBAN
              (DIMENSIONLESS)

LMP.K=TABHL(LMPT,PPOLX.K,0,100,10)                             29, A
LMPT=1.0/.99/.97/.95/.90/.85/.75/.65/.55/.40/.20               29.1, T
    LMP     - LIFETIME MULTIPLIER FROM PERSISTENT
              POLLUTION (DIMENSIONLESS)
    TABHL   - A FUNCTION WITH VALUES SPECIFIED BY A TABLE
    LMPT    - LMP TABLE
    PPOLX   - INDEX OF PERSISTENT POLLUTION
              (DIMENSIONLESS)

  BIRTH RATE SUBSECTOR

B.KL=CLIP(D.K,(TF.K*P2.K*0.5/RLT),TIME.K,PET)                  30, R
RLT=30                                                         30.1, C
PET=4000                                                       30.2, C
    B       - BIRTHS PER YEAR (PERSONS/YEAR)
    CLIP    - A FUNCTION SWITCHED DURING THE RUN
    D       - DEATHS PER YEAR (PERSONS/YEAR)
    TF      - TOTAL FERTILITY (DIMENSIONLESS)
    P2      - POPULATION, AGES 15-44 (PERSONS)
    RLT     - REPRODUCTIVE LIFETIME (YEARS)
    TIME    - CURRENT TIME IN THE SIMULATION RUN
    PET     - POPULATION EQUILIBRIUM TIME (YEAR)

CBR.K=1000*B.JK/POP.K                                          31, S
    CBR     - CRUDE BIRTH RATE (BIRTHS/1000 PERSON-YEARS)
    B       - BIRTHS PER YEAR (PERSONS/YEAR)
    POP     - POPULATION (PERSONS)

TF.K=MIN(MTF.K,(NTF.K*(1-FCE.K)+DTF.K*FCE.K))                  32, A
    TF      - TOTAL FERTILITY (DIMENSIONLESS)
    MIN     - MINIMUM VALUE FUNCTION
    MTF     - MAXIMUM TOTAL FERTILITY (DIMENSIONLESS)
    FCE     - FERTILITY CONTROL EFFECTIVENESS
              (DIMENSIONLESS)
    DTF     - DESIRED TOTAL FERTILITY (DIMENSIONLESS)

MTF.K=MTFN*FM.K                                                33, A
MTFN=12                                                        33.1, C
    MTF     - MAXIMUM TOTAL FERTILITY (DIMENSIONLESS)
    MTFN    - MAXIMUM TOTAL FERTILITY NORMAL
              (DIMENSIONLESS)
    FM      - FECUNDITY MULTIPLIER  (DIMENSIONLESS)

FM.K=TABHL(FMT,LE.K,0,80,10)                                   34, A
FMT=0/.2/.4/.6/.8/.9/1.05/1.1                                  34.1, T
    FM      - FECUNDITY MULTIPLIER  (DIMENSIONLESS)
    TABHL   - A FUNCTION WITH VALUES SPECIFIED BY A TABLE
    FMT     - FM TABLE
    LE      - LIFE EXPECTANCY (YEARS)


DTF.K=DCFS.K*CMPLE.K                                           35, A
    DTF     - DESIRED TOTAL FERTILITY (DIMENSIONLESS)
    DCFS    - DESIRED COMPLETED FAMILY SIZE (DIMENSIONLESS)
    CMPLE   - COMPENSATORY MULTIPLIER FROM PERCEIVED LIFE
              EXPECTANCY (DIMENSIONLESS)

CMPLE.K=TABHL(CMPLET,PLE.K,0,80,10)                            36, A
CMPLET=3/2.1/1.6/1.4/1.3/1.2/1.1/1.05/1                        36.1, T
    CMPLE   - COMPENSATORY MULTIPLIER FROM PERCEIVED LIFE
              EXPECTANCY (DIMENSIONLESS)
    TABHL   - A FUNCTION WITH VALUES SPECIFIED BY A TABLE
    CMPLET  - CMPLE TABLE
    PLE     - PERCEIVED LIFE EXPECTANCY (YEARS)
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PLE.K=DLINF3(LE.K,LPD)                                         37, A
LPD=20                                                         37.1, C
    PLE     - PERCEIVED LIFE EXPECTANCY (YEARS)
    DLINF3  - THIRD-ORDER EXPONENTIAL INFORMATION DELAY
    LE      - LIFE EXPECTANCY (YEARS)
    LPD     - LIFETIME PERCEPTION DELAY (YEARS)

DCFS.K=CLIP(2.0,DCFSN*FRSN.K*SFSN.K,TIME.K,ZPOT)               38, A
ZPOT=4000                                                      38.1, C
DCFSN=4                                                        38.2, C
    DCFS    - DESIRED COMPLETED FAMILY SIZE (DIMENSIONLESS)
    CLIP    - A FUNCTION SWITCHED DURING THE RUN
    DCFSN   - DESIRED COMPLETED FAMILY SIZE NORMAL
              (DIMENSIONLESS)
    FRSN    - FAMILY RESPONSE TO SOCIAL NORM
              (DIMENSIONLESS)
    SFSN    - SOCIAL FAMILY SIZE NORM (DIMENSIONLESS)
    TIME    - CURRENT TIME IN THE SIMULATION RUN
    ZPOT    - TIME WHEN DESIRED FAMILY SIZE EQUALS 2
              CHILDREN (YEAR)

SFSN.K=TABHL(SFSNT,DIOPC.K,0,800,200)                          39, A
SFSNT=1.25/1.9/.8/.75                                          39.1, T
    SFSN    - SOCIAL FAMILY SIZE NORM (DIMENSIONLESS)
    TABHL   - A FUNCTION WITH VALUES SPECIFIED BY A TABLE
    SFSNT   - SFSN TABLE
    DIOPC   - DELAYED INDUSTRIAL OUTPUT PER CAPITA
              (DOLLARS/PERSON-YEAR)

DIOPC.K=DLINF3(IOPC.K,SAD)                                     40, A
SAD=20                                                         40.1, C
    DIOPC   - DELAYED INDUSTRIAL OUTPUT PER CAPITA
              (DOLLARS/PERSON-YEAR)
    DLINF3  - THIRD-ORDER EXPONENTIAL INFORMATION DELAY
    IOPC    - INDUSTRIAL OUTPUT PER CAPITA (DOLLARS/
              PERSON-YEAR)
    SAD     - SOCIAL ADJUSTMENT DELAY (YEARS)


FRSN.K=TABHL(FRSNT,FIE.K,-.2,.2,.1)                            41, A
FRSNT=.5/.6/.7/.85/1                                           41.1, T
FRSN=.82                                                       41.2, N
    FRSN    - FAMILY RESPONSE TO SOCIAL NORM
              (DIMENSIONLESS)
    TABHL   - A FUNCTION WITH VALUES SPECIFIED BY A TABLE
    FRSNT   - FRSN TABLE
    FIE     - FAMILY INCOME EXPECTATION (DIMENSIONLESS)

FIE.K=(IOPC.K-AIOPC.K)/AIOPC.K                                 42, A
    FIE     - FAMILY INCOME EXPECTATION (DIMENSIONLESS)

    IOPC    - INDUSTRIAL OUTPUT PER CAPITA (DOLLARS/
              PERSON-YEAR)
    AIOPC   - AVERAGE INDUSTRIAL OUTPUT PER CAPITA
              (DOLLARS/PERSON-YEAR)

AIOPC.K=SMOOTH(IOPC.K,IEAT)                                    43, A
IEAT=1                                                         43.1, C
    AIOPC   - AVERAGE INDUSTRIAL OUTPUT PER CAPITA
              (DOLLARS/PERSON-YEAR)
    SMOOTH  - FIRST-ORDER EXPONENTIAL INFORMATION DELAY
    IOPC    - INDUSTRIAL OUTPUT PER CAPITA (DOLLARS/
              PERSON-YEAR)
    IEAT    - INCOME EXPECTATION AVERAGING TIME (YEARS)

NFC.K=(MTF.K/DTF.K)-1                                          44, A
    NFC     - NEED FOR FERTILITY CONTROL (DIMENSIONLESS)
    MTF     - MAXIMUM TOTAL FERTILITY (DIMENSIONLESS)
    DTF     - DESIRED TOTAL FERTILITY (DIMENSIONLESS)

FCE.K=CLIP(1.0,(TABHL(FCET,FCFPC.K,0,3,.5)),TIME.K,          45, A
    FCEST)
FCEST=4000                                                     45.1, C
FCET=.75/.85/.9/.95/.98/.99/1                                  45.2, T
    FCE     - FERTILITY CONTROL EFFECTIVENESS
              (DIMENSIONLESS)
    CLIP    - A FUNCTION SWITCHED DURING THE RUN
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