```sas
%let seed_sk = %eval(&seed*8) ;
/*
proc import file = "&par_path/parameters_SK_model2.csv" out = par_sk
dbms=csv replace ;
run ;*/

data par_sk ;
infile "&par_path/parameters_SK_model2.csv" DSD MISSOVER delimiter =
"," termstr = CRLF lrecl = 32767 firstobs = 2 ;
informat variable $15. ;
informat estimate BEST12. ;
format variable $15. ;
format estimate BEST12. ;
input variable $
        estimate ;
run ;


/*
proc import file = "&par_path/vres_SK_model2.csv" out = v_sk
dbms=csv replace ;
run ;*/

data v_sk ;
infile "&par_path/vres_SK_model2.csv" DSD MISSOVER delimiter = ","
termstr = CRLF lrecl = 32767 firstobs = 2 ;
informat v BEST12. ;
format v BEST12. ;
input v ;
run ;

data _null_ ;
set v_sk ;
call symput("sd",sqrt(v)) ;
run ;

/* generate u following a uniform law */

proc sort data = h_sk ;
by sa0100 sa0010 im0100 ;
run ;

data h_sk ;
set h_sk ;
retain x1 &seed_sk x2 0 ;
if _n_ = 1 then do ;
    x1 = &seed_sk ;
    x2 = 0 ;
end ;
else do ;
    y = mod(x1*20077+12345,65536) ;
    x2 = mod(int((x1*20077+12345-y)/65536)+mod(16838*x1+20077
*x2,65536),32768) ;
    x1 = y ;
end ;
z = 65536*x2+x1 ;
u = z/2147483648 ;
drop y z x1 x2 ;
```

```sas
    run ;


    /* compute the consumption */

    data par_sk ;
    set par_sk ;
    call symput(compress("par"!!_n_),estimate) ;
    run ;



    data h_sk ;
    set h_sk ;
    /* reshape covariates */
    cfood = hi0100*12 ;
    cresto = hi0200*12 ;
    rent = max(hb2300*12,0) ;
    l_cfood = log(max(cfood,1)) ;
    l_cresto = log(max(cresto,1)) ;
    l_rent = log(max(rent,1)) ;
    head_male = (ra0200 = 1) ;
    owner = (hb0300 in (1,2)) ;
    free_use = (hb0300 = 4) ;
    hhsize_1 = (dh0001 = 1) ;
    hhsize_3 = (dh0001 >= 3) ;
    agerp_1 = (ra0300 < 30) ;
    agerp_2 = (30 <= ra0300 < 40) ;
    agerp_3 = (40 <= ra0300 < 50) ;
    agerp_4 = (50 <= ra0300 < 60) ;
    agerp_5 = (60 <= ra0300 < 70) ;
    agerp_6 = (ra0300 >= 70) ;
    number_children_1 = (number_children = 1) ;
    number_children_2 = (number_children = 2) ;
    number_children_3 = (number_children = 3) ;
    labour_status_1 = (pe0100a in (1,2)) ;
    labour_status_2 = (pe0100a in (3,4,6,7,8,9)) ;
    labour_status_3 = (pe0100a = 5) ;
    diploma_1 = (pa0200 = 1) ;
    diploma_2 = (pa0200 = 2) ;
    diploma_5 = (pa0200 = 5) ;
    run ;

    proc sort data = h_sk ;
    by im0100 ;
    run ;



    proc univariate data = h_sk ;
    by im0100 ;
    var di2000 ;
    weight hw0010 ;
    output out = perc_implicates pctlpts = 20 40 60 80 pctlpre=p ;
    run ;


    proc univariate data = perc_implicates ;
```

```sas
var p20 p40 p60 p80 ;
output out = perc mean = p20 p40 p60 p80 ;
run ;


data perc;
set perc ;
call symput("quint1",p20) ;
call symput("quint2",p40) ;
call symput("quint3",p60) ;
call symput("quint4",p80) ;
run ;



data h_sk ;
set h_sk ;
income_quintile_1 = (di2000 <= &quint1) ;
income_quintile_2 = (&quint1 < di2000 <= &quint2) ;
income_quintile_3 = (&quint2 < di2000 <= &quint3) ;
income_quintile_4 = (&quint3 < di2000 <= &quint4) ;
income_quintile_5 = (di2000 > &quint4) ;
run ;



/* set up bounds */
/*
proc import file = "&par_path/bound_SK.csv" out = bound_sk dbms=csv
replace ;
run ;*/

data bound_sk ;
infile "&par_path/bound_SK.csv" DSD MISSOVER delimiter = "," termstr
= CRLF lrecl = 32767 firstobs = 2 ;
informat m BEST12. ;
format m BEST12. ;
input m ;
run ;

data _null_ ;
set bound_sk ;
call symput("m",m) ;
run ;


/* compute consumption */

data h_sk ;
set h_sk ;
/* bounds */
lbound = cfood+cresto+rent ;
ubound = &m*12 ;
a = log(lbound) ;
b = log(ubound) ;
Xbeta = &par1+&par2*l_cfood+&par3*(l_cfood**2)+&par4*(l_cfood**3)
    +&par5*income_quintile_2+&par6*income_quintile_3+&par7
*income_quintile_4+&par8*income_quintile_5
    +&par9*l_cresto+&par10*(l_cresto**2)+&par11*(l_cresto**3)
    +&par12*l_rent+&par13*(l_rent**2)+&par14*(l_rent**3)
```

```sas
    +&par15*agerp_1+&par16*agerp_2+&par17*agerp_4+&par18*agerp_5
+&par19*agerp_6
    +&par20*hhsize_1+&par21*hhsize_3
    +&par22*number_children_1+&par23*number_children_2+&par24
*number_children_3
    +&par25*owner+&par26*free_use
    +&par27*diploma_1+&par28*diploma_2+&par29*diploma_5
    +&par30*labour_status_2+&par31*labour_status_3
    +&par32*l_cfood*income_quintile_2+&par33*(l_cfood**2)
*income_quintile_2+&par34*(l_cfood**3)*income_quintile_2
    +&par35*l_cfood*income_quintile_3+&par36*(l_cfood**2)
*income_quintile_3+&par37*(l_cfood**3)*income_quintile_3
    +&par38*l_cfood*income_quintile_4+&par39*(l_cfood**2)
*income_quintile_4+&par40*(l_cfood**3)*income_quintile_4
    +&par41*l_cfood*income_quintile_5+&par42*(l_cfood**2)
*income_quintile_5+&par43*(l_cfood**3)*income_quintile_5 ;
Phi_a = cdf('NORMAL',a-Xbeta,0,&sd) ;
Phi_b = cdf('NORMAL',b-Xbeta,0,&sd) ;
/* estimation of consumption */
/*alpha = a/&sd ;
beta = b/&sd ;
correction_mean = &sd*(pdf('NORMAL',alpha) - pdf('NORMAL',beta))/
(cdf('NORMAL',beta) - cdf('NORMAL',alpha)) ;
correction_sd = 1+(alpha*pdf('NORMAL',alpha)-beta*pdf
('NORMAL',beta))/(cdf('NORMAL',beta) - cdf('NORMAL',alpha))-((pdf
('NORMAL',alpha)-pdf('NORMAL',beta))/(cdf('NORMAL',beta) - cdf
('NORMAL',alpha)))**2 ;*/
DI3001 = round(exp(Xbeta+quantile('NORMAL',Phi_a + (Phi_b-Phi_a)
*u,0,&sd))) ;
run ;
```