```sas
%let seed_fr = %eval(&seed*5) ;
/*
proc import file = "&par_path/parameters_FR_model2.csv" out = par_fr
dbms=csv replace ;
run ;*/

data par_fr ;
infile "&par_path/parameters_FR_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_FR_model2.csv" out = v_fr
dbms=csv replace ;
run ;*/

data v_fr ;
infile "&par_path/vres_FR_model2.csv" DSD MISSOVER delimiter = ","
termstr = CRLF lrecl = 32767 firstobs = 2 ;
informat v BEST12. ;
format v BEST12. ;
input v ;
run ;


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

/* generate u following a uniform law */

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

data h_fr ;
set h_fr ;
retain x1 &seed_fr x2 0 ;
if _n_ = 1 then do ;
   x1 = &seed_fr ;
   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 ;
```

```sas
        drop y z x1 x2 ;
        run ;


        /* compute the consumption */

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




        data h_fr ;
        set h_fr ;
        /* reshape covariates */
        cfood = hi0100*12 ;
        cresto = hi0200*12 ;
        cutil = hni0100*12 ;
        rent = max(hb2300*12,0) ;
        l_cfood = log(max(cfood,1)) ;
        l_cresto = log(max(cresto,1)) ;
        l_cutil = log(max(cutil,1)) ;
        l_rent = log(max(rent,1)) ;
        head_male = (ra0200 = 1) ;
        owner_or_free = (hb0300 in (1,2,4)) ;
        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_fr ;
        by im0100 ;
        run ;


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

```sas
proc univariate data = perc_implicates ;
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_fr ;
set h_fr ;
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_FR.csv" out = bound_fr dbms=csv
replace ;
run ;*/

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


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


/* compute consumption */

data h_fr ;
set h_fr ;
/* bounds */
lbound = cfood+cresto+cutil+rent ;
ubound = &m ;
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_cutil+&par13*(l_cutil**2)+&par14*(l_cutil**3)
    +&par15*l_rent+&par16*(l_rent**2)+&par17*(l_rent**3)
    +&par18*agerp_1+&par19*agerp_2+&par20*agerp_4+&par21*agerp_5
+&par22*agerp_6
    +&par23*head_male
    +&par24*hhsize_1+&par25*hhsize_3
    +&par26*number_children_1+&par27*number_children_2+&par28
*number_children_3
    +&par29*owner_or_free
    +&par30*diploma_1+&par31*diploma_2+&par32*diploma_5
    +&par33*labour_status_2+&par34*labour_status_3
    +&par35*l_cfood*income_quintile_2+&par36*(l_cfood**2)
*income_quintile_2+&par37*(l_cfood**3)*income_quintile_2
    +&par38*l_cfood*income_quintile_3+&par39*(l_cfood**2)
*income_quintile_3+&par40*(l_cfood**3)*income_quintile_3
    +&par41*l_cfood*income_quintile_4+&par42*(l_cfood**2)
*income_quintile_4+&par43*(l_cfood**3)*income_quintile_4
    +&par44*l_cfood*income_quintile_5+&par45*(l_cfood**2)
*income_quintile_5+&par46*(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 ;
```