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%let seed_de = %eval(&seed*11) ;

data par_de ;
infile "&par_path/parameters_DE_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 ;

data v_de ;
infile "&par_path/vres_DE_model2.csv" DSD MISSOVER delimiter = ","
termstr = CRLF lrecl = 32767 firstobs = 2 ;
informat v BEST12. ;
format v BEST12. ;
input v ;
run ;

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

/* generate u following a uniform law */

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

data h_de ;
set h_de ;
retain x1 &seed_de x2 0 ;
if _n_ = 1 then do ;
    x1 = &seed_de ;
    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 ;
run ;

/* compute the consumption */

data par_de ;

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

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data h_de ;
set h_de ;
/* reshape covariates */
cfood = (hi0100+hi0200) ;
rent = max(hb2300,0) ;
l_cfood = log(max(cfood,1)) ;
l_rent = log(max(rent,1)) ;
head_male = (ra0200 = 1) ;
owner_or_free = (hb0300 in (1,2,4)) ;
tenant = (hb0300 = 3) ;
free_use = (hb0300 = 4) ;
hhsizes_1 = (dh0001 = 1) ;
hhsizes_2 = (dh0001 = 2) ;
hhsizes_3 = (dh0001 >= 3) ;
agerp_1 = (ra0300 <= 20) ;
agerp_2 = (20 < ra0300 <= 30) ;
agerp_3 = (30 < ra0300 <= 40) ;
agerp_4 = (40 < ra0300 <= 50) ;
agerp_5 = (50 < ra0300 <= 60) ;
agerp_6 = (60 < ra0300 <= 70) ;
agerp_7 = (ra0300 > 70) ;
number_children_1 = (number_children = 1) ;
number_children_2 = (number_children = 2) ;
number_children_3 = (number_children = 3) ;
diploma_1 = (pa0200 in (1,2)) ;
diploma_2 = (pa0200 = 3) ;
diploma_3 = (pa0200 = 5) ;
run ;

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proc sort data = h_de ;
by im0100 ;
run ;

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

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proc univariate data = perc_implicates ;
var p20 p40 p60 p80 ;
output out = perc_mean = p20 p40 p60 p80 ;
run ;

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data perc;
set perc ;
call symput("quint1",p20) ;
call symput("quint2",p40) ;

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call symput("quint3",p60) ;
call symput("quint4",p80) ;
run ;

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data h_de ;
set h_de ;
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 ;

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/* compute consumption */

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data h_de ;
set h_de ;
/* bounds */
lbound = cfood+rent ;
a = log(lbound) ;
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*income_quintile_2*l_cfood+&par10*income_quintile_2*
(l_cfood**2)+&par11*income_quintile_2*(l_cfood**3)
        +&par12*income_quintile_3*l_cfood+&par13*income_quintile_3*
(l_cfood**2)+&par14*income_quintile_3*(l_cfood**3)
        +&par15*income_quintile_4*l_cfood+&par16*income_quintile_4*
(l_cfood**2)+&par17*income_quintile_4*(l_cfood**3)
        +&par18*income_quintile_5*l_cfood+&par19*income_quintile_5*
(l_cfood**2)+&par20*income_quintile_5*(l_cfood**3)
        +&par21*l_rent+&par22*(l_rent**2)+&par23*(l_rent**3)
        +&par24*agerp_1+&par25*agerp_2+&par26*agerp_4+&par27*agerp_5
+&par28*agerp_6+&par29*agerp_7
        +&par30*head_male
        +&par31*owner_or_free
        +&par32*hhsz_2+&par33*hhsz_3
        +&par34*number_children_1+&par35*number_children_2+&par36
*number_children_3
        +&par37*diploma_2+&par38*diploma_3 ;
Phi_a = cdf('NORMAL',a-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 + (1-Phi_a)*u,0,
&sd))) ;
run ;

```

