jermann98.mod

```
//----------------------------------------------------------------------
// 1. Variable declaration
//----------------------------------------------------------------------

var c, d, erp1, i, k, r1, rf1, w, y, z, mu;
varexo ez;
```

(continued)

```
  //---------------------------------------------------------------------
// 2. Parameter declaration and calibration
//---------------------------------------------------------------------

parameters alf, chihab, xi, delt, tau, g, rho, a1, a2, betstar, bet;

alf         = 0.36;    // capital share in production function
chihab      = 0.819;   // habit formation parameter
xi          = 1/4.3;   // capital adjustment cost parameter
delt        = 0.025;   // quarterly deprecition rate
g           = 1.005;   //quarterly growth rate (note zero growth =>g=1)
tau         = 5;       // curvature parameter with respect to c
rho         = 0.95;    // AR(1) parameter for technology shock

a1          = (g-1+delt)^(1/xi);
a2          = (g-1+delt)-(((g-1+delt)^(1/xi))/(1-(1/xi)))*
              ((g-1+delt)^(1-(1/xi)));
betstar     = g/1.011138;
bet         = betstar/(g^(1-tau));
```

(continued)

```
//---------------------------------------------------------------------
// 3. Model declaration
//---------------------------------------------------------------------

model;
g*k  = (1-delt)*k(-1) + ((a1/(1-1/xi))*(g*i/k(-1))^(1-1/xi)+a2)*k(-1);
d    = y - w - i;
w    = (1-alf)*y;
y    = z*g^(-alf)*k(-1)^alf;
c    = w + d;
mu   = (c-chihab*c(-1)/g)^(-tau)-chihab*bet*(c(+1)*g-chihab*c)^(-tau);
mu   = (betstar/g)*mu(+1)*(a1*(g*i/k(-1))^(-1/xi))*(alf*z(+1)*g^(1-alf)*
       (k^(alf-1))+((1-delt+(a1/(1-1/xi))*(g*i(+1)/k)^(1-1/xi)+a2))/
       (a1*(g*i(+1)/k)^(-1/xi))-g*i(+1)/k);
log(z) = rho*log(z(-1)) + ez;
```

(continued)

```
rf1  = 1/expectation(0)((betstar/g)*mu(+1)/mu);
r1   = (a1*(g*i/k(-1))^(-1/xi))*(alf*z(+1)*g^(1-alf)*(k^(alf-1))+
       (1-delt+(a1/(1-1/xi))*(g*i(+1)/k)^(1-1/xi)+a2)/
       (a1*(g*i(+1)/k)^(-1/xi))-g*i(+1)/k);
erp1 = r1 - rf1;

end;
```

(continued)

```
steady_state_model;
rf1    = (g/betstar);
r1     = (g/betstar);
erp1   = r1-rf1;
z      = 1;
k      = (((g/betstar)-(1-delt))/(alf*g^(1-alf)))^(1/(alf-1));
y      = (g^(1-alf))*k^alf;
w      = (1-alf)*y;
i      = (1-(1/g)*(1-delt))*k;
d      = y - w - i;
c      = w + d;
mu     = ((c-(chihab*c/g))^(-tau))-chihab*bet*((c*g-chihab*c)^(-tau));
ez     = 0;
end;
```

(continued)

```
steady;

shocks;
var ez; stderr 0.01;
end;

stoch_simul (order=2) rf1, r1, erp1, y, z, c, d, mu, k;
```

3rd order approximation

- For 3rd order use

```
stoch_simul (order=3, periods=50000) rf1, r1, erp1, y, z, c, d, mu, k;
```

- Don't forget option *periods*= in order to compute empirical moments