```matlab
% g_C=16% (Government consumption-GDP ratio=16%) and ξ=1.350 (Bonds-money ratio=1.350)


% Parameter values
tau_k=0.276; % Capital income tax rate
tau_w=0.224; % Labor income tax rate
tau_c=0.08;  % Consumption tax rate
g_I=0.035;   % Ratio of government investment to real GDP
g_C=0.160;   % Ratio of government consumption to real GDP
g_W=0;       % Ratio of wastful government expenditure to real GDP
beta=1.4;    % Weight of leisure in utility
etha=0.12;   % Weight of real balances in utility
phai=0.22;   % Weight of government consumption in utility
share=0.6;   % Labor share in output
effic=0.9;   % TFP
rho=0.04;    % Rate of time preference
ganmma=-1.5; % Elasticity of intertemporal substitution in consumption
epsiron=0.6; % Geometric weight of average externalities derived from private capital
kusai=1.350; % Bonds-money ratio
t_ss=0.0137; % Lump-sum-tax-wealth ratio

nobs=200;    % periods


% Steady state values of z and l
fun = @rootGT1;
x0 = [0.7,0.7];

param=[tau_k tau_w tau_c g_I g_C g_W beta etha phai share effic rho ganmma epsiron];

x = fsolve(fun,x0,optimset,param);

zss=x(1); % Steady state ratio of public capital to private capital, z*
lss=x(2); % Steady state value of leisure, l*


% Balanced growth equilibrium values

css=((1-tau_w)/(1+tau_c))*share*effic*(1-lss)^(share-1)*zss^(share*(1-epsiron))*lss/beta;  % Consumption-capital ratio, c*
yss=effic*(1-lss)^share*zss^(share*(1-epsiron));                                             % Output-capital ratio, y*
(1-g_I-g_C-g_W)*yss;                                                                         % (Consumption+Investment)/private capital
rss=(1-share)*effic*(1-lss)^share*zss^(share*(1-epsiron));                                   % Before-tax return on private capital, r*
(1-tau_k)*rss;                                                                               % After-tax return on capital, (1-tau_k)r*
Pai=1-ganmma-etha*ganmma-phai*ganmma;                                                        % value of Π in (12c)
Gss=((1-tau_k)*rss-rho)/Pai;                                                                 % Balanced growth rate of real GDP
mss=(((1+etha)*tau_c+etha)*css+(tau_k*(1-share)+tau_w*share-g_I-g_C-g_W)*yss-t_ss)/((t_ss+(1-1/Pai)*(1-tau_k)*rss+rho/Pai)*(1+kusai));  % Real
money balances-capital ratio, m*
mss/css;                                                                                     % Money-caonsumption ratio
theta_ss=(etha*(1+tau_c)*css/mss-((1-1/Pai)*(1-tau_k)*rss+rho/Pai));                         % Money growth rate, θ*
infl=etha*(1+tau_c)*css/mss-(1-tau_k)*rss;                                                   % Inflation rate, π*
Piketty=(Pai-1)*(1-tau_k)*rss/Pai-rho/Pai;                                                   % (1-tau_k)rss-Gss


% Local stability

theta_L=((1-share)*(1-ganmma-phai*ganmma)+phai*ganmma)*lss/(1-lss)+(1-ganmma-beta*ganmma); % Δ in (12c)

y_z=share*(1-epsiron)*yss/zss;           % dy/dz
y_l=-share*yss/(1-lss);                  % dy/dl

c_z=(1-epsiron)*share*css/zss;           % dc/dz
c_l=((1-share)*lss/(1-lss)+1)*css/lss;   % dc/dl

r_z=share*(1-epsiron)*rss/zss;           % dr/dz
r_l=-share*rss/(1-lss);                  % dr/dl

G_k=(1-g_I-g_C-g_W)*yss-css;                            % Growth rate of private capital
G_kp=g_I*effic*(1-lss)^share*zss^(share*(1-epsiron)-1); % Growth rate of public capital

G_kl=-share*(1-g_I-g_C-g_W)*yss/(1-lss)-((1-share)*lss/(1-lss)+1)*css/lss; % d(G_k)/dl
G_kz=share*(1-epsiron)*G_k/zss;                                             % d(G_k)/dz

G_kpz=-(1-share*(1-epsiron))*G_kp/zss;     % d(G_kp)/dz
G_kpl=-share*G_kp/(1-lss);                 % d(G_kp)/dl

% Elements of (15)
```

```
a_31=mss*((g_I+g_C-(1-share)*tau_k-share*tau_w)*y_l+(1-tau_k)*r_l*(1+kusai)*mss-(tau_c+etha*(1+tau_c))*c_l)/((1+kusai)*mss)-G_kl*mss;  % a_31
a_32=mss*((g_I+g_C-(1-share)*tau_k-share*tau_w)*y_z+(1-tau_k)*r_z*(1+kusai)*mss-(tau_c+etha*(1+tau_c))*c_z)/((1+kusai)*mss)-G_kz*mss;  % a_32
a_33=-((g_I+g_C-(1-share)*tau_k-share*tau_w)*yss-(tau_c+etha*(1+tau_c))*css+t_ss)/((1+kusai)*mss);                                    % a_33

a_21=(G_kpl-G_kl)*zss;        % a_21
a_22=(G_kpz-G_kz)*zss;        % a_22
a_23=0;                       % a_23

a_11=(etha*ganmma*a_31/mss-Pai*G_kl-share*(1-epsiron)*(1-ganmma-phai*ganmma)*a_21/zss+(1-tau_k)*r_l)*(lss/theta_L);  % a_31
a_12=(etha*ganmma*a_32/mss-Pai*G_kz-share*(1-epsiron)*(1-ganmma-phai*ganmma)*a_22/zss+(1-tau_k)*r_z)*(lss/theta_L);  % a_32
a_13=(etha*ganmma*a_33/mss)*(lss/theta_L);                                                                          % a_33


A=[a_11 a_12 a_13; a_21 a_22 a_23; a_31 a_32 a_33];    % Jacobian in (15)
e=eig(A);                                             % Three eigenvalues in jacobian

% Saddle path
Meig=sort(e);
lambda=diag(Meig);
lambda(1,1);                          % Unique stable root

A_1=(lambda(1,1)-a_22)/a_21;          % Coefficient of saddle path of leisure
A_2=a_32+a_31*A_1;                    % Coefficient of saddle path of money, Numerator
A_3=lambda(1,1)-a_33;                 % Coefficient of saddle path of money, Denominator

za=0.5759;                            % A value of z(0) equal to pre-shock value, Public capital-private capital ratio
  z=[]; z=[z;0.5759];
la=lss+A_1*(za-zss);                  % A value of l(0), lesiure
  l=[]; l=[l;la];
ma=mss+(A_2/A_3)*(za-zss);            % A value of m(0), real balances-capital ratio
  m=[]; m=[m;ma];
ca=((1-tau_w)/(1+tau_c))*share*effic*(1-la)^(share-1)*za^(share*(1-epsiron))*la/beta;  % A value of c(0), Initial consumption-capital ratio
  c=[]; c=[c;ca];
ra=(1-share)*effic*(1-la)^share*za^(share*(1-epsiron));                                % A value of r(0), Initial before-tax return on private
capital
  r=[]; r=[r;ra];
minfl_a=etha*(1+tau_c)*ca/ma-(1-tau_k)*ra;                                             % A value of π(0), Initial inflation rate
  infl=[]; infl=[infl;minfl_a];

ya=effic*(1-la)^share*za^(share*(1-epsiron));                                          % A value of y(0), Initial ratio of GDP to private capital
  y=[]; y=[y;ya];
mG_ka=(1-g_I-g_C-g_W)*ya-ca;                                                           % Growth rate of private capital in period 0
  G_k=[]; G_k=[G_k;mG_ka];
mG_kpa=g_I*ya/za;                                                                      % Growth rate of public capital in period 0
  G_kp=[]; G_kp=[G_kp;mG_kpa];
mtheta_a=((g_I+g_C+g_W-(1-share)*tau_k-share*tau_w)*ya-(tau_c-kusai*etha*(1+tau_c))*ca+(1+(1+kusai)*ma)*t_ss)/((1+kusai)*ma);            % Money
growth rate in period 0
  theta=[]; theta=[theta;mtheta_a];
G_la=(la/theta_L)*(etha*ganmma*(theta-minfl_a-mG_ka)-Pai*mG_ka-share*(1-epsiron)*(1-ganmma-phai*ganmma)*(mG_kpa-mG_ka)+(1-tau_k)*ra-rho); % Groth
rate of leisure in period 0
  G_l=[]; G_l=[G_l;G_la];
mG_ya=-share*(G_la/(1-la))+share*(1-epsiron)*mG_kpa+(1-share*(1-epsiron))*mG_ka;       % Grwoth rate of GDP in period 0
  G_y=[]; G_y=[G_y;mG_ya];
mPiketa=(1-tau_k)*ra-mG_ya;                                                            % (1-tau_k)r-G_y in period 0
  Piket=[]; Piket=[Piket;mPiketa];
mG_wa=((1+kusai)*ma/(1+(1+kusai)*ma))*(theta-minfl_a)+(1/(1+(1+kusai)*ma))*mG_ka;      % Grwoth rate of wealth in period 0
  G_w=[]; G_w=[G_w;mG_wa];


% Inequality in a balnaced growth path
nyu=beta/(1+beta+etha);                                   % ν in (17)
wss_tild=share*effic*(1-lss)^(share-1)*zss^(share*(1-epsiron)); % w*/K*, Real wage-private capital ratio in a balanced growth
w0_tild=share*effic*(1-la)^(share-1)*za^(share*(1-epsiron));    % w(0)/K(0) Real wage-private capital in period 0
wtild=[]; wtild=[wtild;w0_tild];

alpha_a=1+(1-tau_w)*(wss_tild/(1+(1+kusai)*mss))*(1-la/lss)/(-lambda(1,1)-(1-tau_w)*(wss_tild/(1+(1+kusai)*mss))*(1-lss/nyu));     % A value of
α(0) in (D-4);
alpha=[]; alpha=[alpha;alpha_a];

omega_a=1+(ma/(1+kusai*ma))*(alpha_a-1+nyu/lss)/alpha_a;       % A value of ω(0) in (D-6), Coefficient of (D-6)
omega=[]; omega=[omega;omega_a];

fey_a=(ra*(1+kusai*ma)/(ra*(1+kusai*ma)+w0_tild*(1-la)))*omega_a-(w0_tild*la/(ra*(1+kusai*ma)+w0_tild*(1-la)))*(1-nyu/lss)/alpha_a; % A value of
φ(0) in (D-8a)
fey=[]; fey=[fey;fey_a];
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pusai_a=((1-tau_k)*ra*(1+kusai*ma)/((1-tau_k)*ra*(1+kusai*ma)+(1-tau_w)*w0_tild*(1-la)))*omega_a-((1-tau_w)*w0_tild*la/((1-tau_k)*ra*(1+kusai*ma)+(1-tau_w)*w0_tild*(1-la)))*(1-nyu/lss)/alpha_a;    % A value of ψ(0), Coefficient of after-tax income inequality
pusai=[]; pusai=[pusai;pusai_a];

kapper=0.406;                                              % (bonds+money)/wealth in the benchmark parameter values

sigma_aa=1+((2*kapper-1)*(1-kapper)*kapper/((1-kapper)^2+kapper^2))*(((1+kusai)*ma/0.6835-1));     % After-shock value of σ_a(0)
sigma_ass=sigma_aa/alpha_a                                                                          % Balanced growth value of σ_a, i.e., σ_a*
sigma_a=[]; sigma_a=[sigma_a;sigma_aa];

sigma_va=omega_a*sigma_aa/1.1634;                          % Inequality of income-earning assets σ_v(0) relative to the benchmark value in period 0
sigma_v=[]; sigma_v=[sigma_v;sigma_va];

sigma_ya=fey_a*sigma_aa/0.2837;                            % Before-tax icncome inequality σ_y(0) relative to the benchmark value in period 0
sigma_y=[]; sigma_y=[sigma_y;sigma_ya];

sigma_yfa=pusai_a*sigma_aa/0.2544;                         % After-tax income ineqaulity σ_ya(0) relative to the benchmark value in period 0
sigma_yf=[]; sigma_yf=[sigma_yf;sigma_yfa];


% Transitional dynamics of average variables and standard deviations

nobs=200;

for t=1:nobs

        zt=zss+exp(lambda(1,1))*(za-zss);       % Dynamics of z(t)
        za=zt;
        z=[z;zt];

        lt=lss+exp(lambda(1,1))*(la-lss);       % Dynamics of l(t)
        la=lt;
        l=[l;lt];

        mt=mss+exp(lambda(1,1))*(ma-mss);       % Dynamics of m(t)
        ma=mt;
        m=[m;mt];

        ct=((1-tau_w)/(1+tau_c))*share*effic*(1-lt)^(share-1)*zt^(share*(1-epsiron))*lt/beta;  % Dynamics of c(t)
        c=[c;ct];

        rt=(1-share)*effic*(1-lt)^share*zt^(share*(1-epsiron));                                % Dynamics of m(t)
        r=[r;rt];

        infl_t=etha*(1+tau_c)*ct/mt-(1-tau_k)*rt;                                              % Dynamics of inflation rate
        infl=[infl;infl_t];

        yt=effic*(1-lt)^share*zt^(share*(1-epsiron));                                          % Dynamics of GDP-capital ratio, y(t)
        y=[y;yt];

        G_kt=(1-g_I-g_C-g_W)*yt-ct;              % Growth rate of K(t)
        G_k=[G_k;G_kt];

        G_kpt=g_I*yt/zt;                         % Growth rate of K_p(t)
        G_kp=[G_kp;G_kpt];

        theta_t=((g_I+g_C+g_W-(1-share)*tau_k-share*tau_w)*yt-(tau_c-kusai*etha*(1+tau_c))*ct+(1+(1+kusai)*mt)*t_ss)/((1+kusai)*mt);           % Dynamics of θ(t) money growth rate
        theta=[theta;theta_t];

        G_lt=(lt/theta_L)*(etha*ganmma*(theta_t-infl_t-G_kt)-Pai*G_kt-share*(1-epsiron)*(1-ganmma-phai*ganmma)*(G_kpt-G_kt)+(1-tau_k)*rt-rho); % dl^dot/dt
        G_l=[G_l;G_lt];

        G_yt=-share*(G_lt/(1-lt))+share*(1-epsiron)*G_kpt+(1-share*(1-epsiron))*G_kt;          % Grwoth rate of real GDP
        G_y=[G_y;G_yt];

        Piket_t=(1-tau_k)*rt-G_yt;               % Dynamics of (1-tau_k)r-G_y
        Piket=[Piket;Piket_t];

        G_wt=((1+kusai)*mt/(1+(1+kusai)*mt))*(theta_t-infl_t)+(1/(1+(1+kusai)*mt))*G_kt;         % Grwoth rate of wealth A(t)
        G_w=[G_w;G_wt];

        alpha_t=1+(1-tau_w)*(wss_tild/(1+(1+kusai)*mss))*(1-lt/lss)/(-lambda(1,1)-(1-tau_w)*(wss_tild/(1+(1+kusai)*mss))*(1-lss/nyu)); % Dynamics
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of α(t);
        alpha=[alpha;alpha_t];

        sigma_at=alpha_t*sigma_ass;             % Dynamics of σ_a(t)



        omega_t=1+(mt/(1+kusai*mt))*(alpha_t-1+nyu/lss)/alpha_t;                                % Dynamics of ω(t)
        omega=[omega;omega_t];

        sigma_vt=omega_t*sigma_at/1.1634;       % Dynamics of σ_v(t)

        wtild_t=share*effic*(1-lt)^(share-1)*zt^(share*(1-epsiron));                            % Dynamics of wtild(t)
        wtild=[wtild;wtild_t];

        fey_t=(rt*(1+kusai*mt)/(rt*(1+kusai*mt)+wtild_t*(1-lt)))*omega_t-(wtild_t*lt/(rt*(1+kusai*mt)+wtild_t*(1-lt)))*(1-nyu/lss)/alpha_t; % 
Dynamics of φ(t)
        sigma_yt=fey_t*sigma_at/0.2837;

        pusai_t=((1-tau_k)*rt*(1+kusai*mt)/((1-tau_k)*rt*(1+kusai*mt)+(1-tau_w)*wtild_t*(1-lt)))*omega_t-((1-tau_w)*wtild_t*lt/((1-
tau_k)*rt*(1+kusai*mt)+(1-tau_w)*wtild_t*(1-lt)))*(1-nyu/lss)/alpha_t; % Dynamics of ψ(t)
        sigma_yft=pusai_t*sigma_at/0.2544;

        fey=[fey;fey_t];
        pusai=[pusai;pusai_t];

        sigma_a=[sigma_a;sigma_at];
        sigma_v=[sigma_v;sigma_vt];
        sigma_y=[sigma_y;sigma_yt];
        sigma_yf=[sigma_yf;sigma_yft];



end



% g_C=16% (Government consumption-GDP ratio=16%) and ξ=1.10 (Bonds-money ratio=1.10)

% Parameter values
tau_k=0.276; % Capital income tax rate
tau_w=0.224; % Labor income tax rate
tau_c=0.08;  % Consumption tax rate
g_I=0.035;   % Ratio of government investment to real GDP
g_C=0.160;   % Ratio of government consumption to real GDP
g_W=0;       % Ratio of wastful government expenditure to real GDP
beta=1.4;    % Weight of leisure in utility
etha=0.12;   % Weight of real mney balances in utility
phai=0.22;   % Weight of government consumption in utility
share=0.6;   % Labor share in output
effic=0.9;   % TFP
rho=0.04;    % Rate of time preference
ganmma=-1.5; % Elasticity of intertemporal substitution in consumption
epsiron=0.6; % Geometric weight of average externalities derived from private capital
kusai=1.10;  % Bonds-money ratio
t_ss=0.0137; % Lump-sum-tax-wealth ratio

nobs=200;    % periods


% Steady state values of z and l
fun = @rootGT1;
x0 = [0.7,0.7];

param=[tau_k tau_w tau_c g_I g_C g_W beta etha phai share effic rho ganmma epsiron];

x = fsolve(fun,x0,optimset,param);

nzss=x(1); % Steady state ratio of public capital to private capital, z*
nlss=x(2); % Steady state value of leisure, l*


% Balanced growth equilibrium values

ncss=((1-tau_w)/(1+tau_c))*share*effic*(1-nlss)^(share-1)*nzss^(share*(1-epsiron))*nlss/beta;  % Consumption-capital ratio, c*
nyss=effic*(1-nlss)^share*nzss^(share*(1-epsiron));                                            % Output-capital ratio, y*
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(1-g_I-g_C-g_W)*nyss;                                                                    % Consumption+investment)/capital
nrss=(1-share)*effic*(1-nlss)^share*nzss^(share*(1-epsiron));                            % Before-tax return on private capital, r*
(1-tau_k)*nrss;                                                                          % After-tax return on private capital, (1-tau_k)r*
nPai=1-ganmma-etha*ganmma-phai*ganmma;                                                   % Π in (12c)
nGss=((1-tau_k)*nrss-rho)/nPai;                                                          % Balanced growth rate of real GDP
nmss=(((1+etha)*tau_c+etha)*ncss+(tau_k*(1-share)+tau_w*share-g_I-g_C-g_W)*nyss-t_ss)/((t_ss+(1-1/nPai)*(1-tau_k)*nrss+rho/nPai)*(1+kusai)); % Real
money balances-capital ratio, m*
nmss/ncss;                                                                               % Money-consumption ratio
ntheta_ss=(etha*(1+tau_c)*ncss/nmss-((1-1/nPai)*(1-tau_k)*nrss+rho/nPai));               % Money growth rate
ninfl=etha*(1+tau_c)*ncss/nmss-(1-tau_k)*nrss;                                           % Inflation rate
nPiketty=(nPai-1)*(1-tau_k)*nrss/nPai-rho/nPai;                                          % (1-tau_k)rss-Gss


% Local stability
ntheta_L=((1-share)*(1-ganmma-phai*ganmma)+phai*ganmma)*nlss/(1-nlss)+(1-ganmma-beta*ganmma);  % Δ in (12c)

ny_z=share*(1-epsiron)*nyss/nzss;                  % dy/dz
ny_l=-share*nyss/(1-nlss);                         % dy/dl

nc_z=(1-epsiron)*share*ncss/nzss;                  % dc/dz
nc_l=((1-share)*nlss/(1-nlss)+1)*ncss/nlss;        % dc/dl

nr_z=share*(1-epsiron)*nrss/nzss;                  % dr/dz
nr_l=-share*nrss/(1-nlss);                         % dr/dl

nG_k=(1-g_I-g_C-g_W)*nyss-ncss;                            % Growth rate of private capital
nG_kp=g_I*effic*(1-nlss)^share*nzss^(share*(1-epsiron)-1); % Growth rate of public capital

nG_kl=-share*(1-g_I-g_C-g_W)*nyss/(1-nlss)-((1-share)*nlss/(1-nlss)+1)*ncss/nlss; % d(G_k)/dl
nG_kz=share*(1-epsiron)*nG_k/nzss;                                                % d(G_k)/dz

nG_kpz=-(1-share*(1-epsiron))*nG_kp/nzss;          % d(G_kp)/dz
nG_kpl=-share*nG_kp/(1-nlss);                      % d(G_kp)/dl

% Elements of (15)
na_31=nmss*((g_I+g_C-(1-share)*tau_k-share*tau_w)*ny_l+(1-tau_k)*nr_l*(1+kusai)*nmss-(tau_c+etha*(1+tau_c))*nc_l)/((1+kusai)*nmss)-nG_kl*nmss;  %
a_31
na_32=nmss*((g_I+g_C-(1-share)*tau_k-share*tau_w)*ny_z+(1-tau_k)*nr_z*(1+kusai)*nmss-(tau_c+etha*(1+tau_c))*nc_z)/((1+kusai)*nmss)-nG_kz*nmss;  %
a_32
na_33=-((g_I+g_C-(1-share)*tau_k-share*tau_w)*nyss-(tau_c+etha*(1+tau_c))*ncss+t_ss)/((1+kusai)*nmss);                                         %
a_33

na_21=(nG_kpl-nG_kl)*nzss;                   % a_21
na_22=(nG_kpz-nG_kz)*nzss;                   % a_22
na_23=0;                                     % a_23

na_11=(etha*ganmma*na_31/nmss-nPai*nG_kl-share*(1-epsiron)*(1-ganmma-phai*ganmma)*na_21/nzss+(1-tau_k)*nr_l)*(nlss/ntheta_L);  % a_11
na_12=(etha*ganmma*na_32/nmss-nPai*nG_kz-share*(1-epsiron)*(1-ganmma-phai*ganmma)*na_22/nzss+(1-tau_k)*nr_z)*(nlss/ntheta_L);  % a_12
na_13=(etha*ganmma*na_33/nmss)*(nlss/ntheta_L);                                                                               % a_13

nA=[na_11 na_12 na_13; na_21 na_22 na_23; na_31 na_32 na_33];   % Jacobian in (15)
ne=eig(nA);                                                     % Three eigenvalues in jacobian

% Saddle path
nMeig=sort(ne);
nlambda=diag(nMeig);
nlambda(1,1);                           % Unique stable root

nA_1=(nlambda(1,1)-na_22)/na_21;          % Coefficient of saddle path of leisure
nA_2=na_32+na_31*nA_1;                    % Coefficient of saddle path of money, Numerator
nA_3=nlambda(1,1)-na_33;                  % Coefficient of saddle path of money, Denominator

nza=0.5759;                             % A value of z(0) equal to pre-shock value, Public capital-private capital ratio
  nz=[]; nz=[nz;0.5759];
nla=nlss+nA_1*(nza-nzss);                 % A value of l(0), lesiure
  nl=[]; nl=[nl;nla];
nma=nmss+(nA_2/nA_3)*(nza-nzss);          % A value of m(0), real balances-capital ratio
  nm=[]; nm=[nm;nma];
nca=((1-tau_w)/(1+tau_c))*share*effic*(1-nla)^(share-1)*nza^(share*(1-epsiron))*nla/beta;  % A value of c(0), Initial consumption-capital ratio
  nc=[]; nc=[nc;nca];
nra=(1-share)*effic*(1-nla)^share*nza^(share*(1-epsiron));                                 % A value of r(0), Initial before-tax return on private
capital
  nr=[]; nr=[nr;nra];
ninfl_a=etha*(1+tau_c)*nca/nma-(1-tau_k)*nra;                                              % A value of π(0), Initial inflation rate
  ninfl=[]; ninfl=[ninfl;ninfl_a];

nya=effic*(1-nla)^share*nza^(share*(1-epsiron));                                           % A value of y(0), Initial ratio of GDP to private
```

```
capital
  ny=[]; ny=[ny;nya];
nG_ka=(1-g_I-g_C-g_W)*nya-nca;              % Growth rate of private capital in period 0
  nG_k=[]; nG_k=[nG_k;nG_ka];
nG_kpa=g_I*nya/nza;                         % Growth rate of public capital in period 0
  nG_kp=[]; nG_kp=[nG_kp;nG_kpa];
ntheta_a=((g_I+g_C+g_W-(1-share)*tau_k-share*tau_w)*nya-(tau_c-kusai*etha*(1+tau_c))*nca+(1+(1+kusai)*nma)*t_ss)/((1+kusai)*nma);                %
Money growth rate in period 0
  ntheta=[]; ntheta=[ntheta;ntheta_a];
nG_la=(nla/ntheta_L)*(etha*ganmma*(ntheta-ninfl_a-nG_ka)-nPai*nG_ka-share*(1-epsiron)*(1-ganmma-phai*ganmma)*(nG_kpa-nG_ka)+(1-tau_k)*nra-rho);  %
Grfowth rate of leisure in period 0
  nG_l=[]; nG_l=[nG_l;nG_la];
nG_ya=-share*(nG_la/(1-nla))+share*(1-epsiron)*nG_kpa+(1-share*(1-epsiron))*nG_ka;        % Grwoth rate of real GDP in period 0
  nG_y=[]; nG_y=[nG_y;nG_ya];
nPiketa=(1-tau_k)*nra-nG_ya;                                                              % (1-tau_k)r-G_y in period 0
  nPiket=[]; nPiket=[nPiket;nPiketa];
nG_wa=((1+kusai)*nma/(1+(1+kusai)*nma))*(ntheta-ninfl_a)+(1/(1+(1+kusai)*nma))*nG_ka;      % Grwoth rate of wealth in period 0
  nG_w=[]; nG_w=[nG_w;nG_wa];



% Inequality in a balnaced growth path
nyu=beta/(1+beta+etha);                                            % ν in (17)
wss_tild=share*effic*(1-nlss)^(share-1)*nzss^(share*(1-epsiron)); % w*/K*, Real wage-private capital ratio in a balanced growth
nw0_tild=share*effic*(1-nla)^(share-1)*nza^(share*(1-epsiron));   % w(0)/K(0), real wage-private capital ratio in period 0
nwtild=[]; nwtild=[nwtild;nw0_tild];

nalpha_a=1+(1-tau_w)*(wss_tild/(1+(1+kusai)*nmss))*(1-nla/nlss)/(-nlambda(1,1)-(1-tau_w)*(wss_tild/(1+(1+kusai)*nmss))*(1-nlss/nyu)); % A value of
α(0) in (D-4);
nalpha=[]; nalpha=[nalpha;nalpha_a];

nomega_a=1+(nma/(1+kusai*nma))*(nalpha_a-1+nyu/nlss)/nalpha_a;    % A value of ω(0) in (D-6), Coefficient of (D-6)
nomega=[]; nomega=[nomega;nomega_a];

nfey_a=(nra*(1+kusai*nma)/(nra*(1+kusai*nma)+nw0_tild*(1-nla)))*nomega_a-(nw0_tild*nla/(nra*(1+kusai*nma)+nw0_tild*(1-nla)))*(1-
nyu/nlss)/nalpha_a; % A value of φ(0) in (D-8a)
nfey=[]; nfey=[nfey;nfey_a];

npusai_a=((1-tau_k)*nra*(1+kusai*nma)/((1-tau_k)*nra*(1+kusai*nma)+(1-tau_w)*nw0_tild*(1-nla)))*nomega_a-((1-tau_w)*nw0_tild*nla/((1-
tau_k)*nra*(1+kusai*nma)+(1-tau_w)*nw0_tild*(1-nla)))*(1-nyu/nlss)/nalpha_a; % A value of ψ(0), Coefficient of after-tax income inequality
npusai=[]; npusai=[npusai;npusai_a];

nkapper=0.406;                                                     % (bonds+money)/wealth in the benchmark parameter values

nsigma_aa=1+((2*nkapper-1)*(1-nkapper)*nkapper/((1-nkapper)^2+nkapper^2))*(((1+kusai)*nma/0.6835-1));     % After-shock value of σ_a(0) in period
0
nsigma_ass=nsigma_aa/nalpha_a                                      % Balanced growth value of σ_a, i.e., σ_a*
nsigma_a=[]; nsigma_a=[nsigma_a;nsigma_aa];

nsigma_va=nomega_a*nsigma_aa/1.1634;                               % Inequality of income-earning assets σ_v(0) relative to the benchmark value in
period 0
nsigma_v=[]; nsigma_v=[nsigma_v;nsigma_va];

nsigma_ya=nfey_a*nsigma_aa/0.2837;                                 % Before-tax income inequality σ_y(0) relative to the benchmark value in period
0
nsigma_y=[]; nsigma_y=[nsigma_y;nsigma_ya];

nsigma_yfa=npusai_a*nsigma_aa/0.2544;                              % After-tax income inequality σ_yf(0) relative to the benchmark value in period
0
nsigma_yf=[]; nsigma_yf=[nsigma_yf;nsigma_yfa];


% Transitional dynamics of average variables and standard deviations

nobs=200;

for t=1:nobs

        nzt=nzss+exp(nlambda(1,1))*(nza-nzss);    % Dynamics of z(t)
        nza=nzt;
        nz=[nz;nzt];

        nlt=nlss+exp(nlambda(1,1))*(nla-nlss);    % Dynamics of l(t)
        nla=nlt;
        nl=[nl;nlt];
```

```matlab
        nmt=nmss+exp(nlambda(1,1))*(nma-nmss);    % Dynamics of m(t)
        nma=nmt;
        nm=[nm;nmt];

        nct=((1-tau_w)/(1+tau_c))*share*effic*(1-nlt)^(share-1)*nzt^(share*(1-epsiron))*nlt/beta;   % Dynamics of c(t)
        nc=[nc;nct];

        nrt=(1-share)*effic*(1-nlt)^share*nzt^(share*(1-epsiron));                              % Dynamics of r(t)
        nr=[nr;nrt];

        ninfl_t=etha*(1+tau_c)*nct/nmt-(1-tau_k)*nrt;                                           % Dynamics of inflation rate  π(t)
        ninfl=[ninfl;ninfl_t];

        nyt=effic*(1-nlt)^share*nzt^(share*(1-epsiron));                                        % Dynamics of y(t)
        ny=[ny;nyt];

        nG_kt=(1-g_I-g_C-g_W)*nyt-nct;            % Growth rate of K(t)
        nG_k=[nG_k;nG_kt];

        nG_kpt=g_I*nyt/nzt;                       % Growth rate of K_p(t)
        nG_kp=[nG_kp;nG_kpt];

        ntheta_t=((g_I+g_C+g_W-(1-share)*tau_k-share*tau_w)*nyt-(tau_c-kusai*etha*(1+tau_c))*nct+(1+(1+kusai)*nmt)*t_ss)/((1+kusai)*nmt); %
Dynamics of money growth rate
        ntheta=[ntheta;ntheta_t];

        nG_lt=(nlt/ntheta_L)*(etha*ganmma*(ntheta_t-ninfl_t-nG_kt)-nPai*nG_kt-share*(1-epsiron)*(1-ganmma-phai*ganmma)*(nG_kpt-nG_kt)+(1-
tau_k)*nrt-rho); % dl^dot/dt
        nG_l=[nG_l;nG_lt];

        nG_yt=-share*(nG_lt/(1-nlt))+share*(1-epsiron)*nG_kpt+(1-share*(1-epsiron))*nG_kt;          % Grwoth rate of real GDP
        nG_y=[nG_y;nG_yt];

        nPiket_t=(1-tau_k)*nrt-nG_yt;                                                            % (1-tau_k)r-G_y
        nPiket=[nPiket;nPiket_t];

        nG_wt=((1+kusai)*nmt/(1+(1+kusai)*nmt))*(ntheta_t-ninfl_t)+(1/(1+(1+kusai)*nmt))*nG_kt;      % Grwoth rate of wealth A(t)
        nG_w=[nG_w;nG_wt];

        nalpha_t=1+(1-tau_w)*(wss_tild/(1+(1+kusai)*nmss))*(1-nlt/nlss)/(-nlambda(1,1)-(1-tau_w)*(wss_tild/(1+(1+kusai)*nmss))*(1-nlss/nyu)); %
Dynamics of α(t);
        nalpha=[nalpha;nalpha_t];

        nsigma_at=nalpha_t*nsigma_ass;                                                           % Dynamics of σ_a(t)



        nomega_t=1+(nmt/(1+kusai*nmt))*(nalpha_t-1+nyu/nlss)/nalpha_t;                           % Dynamics of ω(t)
        nomega=[nomega;nomega_t];

        nsigma_vt=nomega_t*nsigma_at/1.1634;                                                     % Dynamics of σ_v(t)

        nwtild_t=share*effic*(1-nlt)^(share-1)*nzt^(share*(1-epsiron));

        nfey_t=(nrt*(1+kusai*nmt)/(nrt*(1+kusai*nmt)+nwtild_t*(1-nlt)))*nomega_t-(nwtild_t*nlt/(nrt*(1+kusai*nmt)+nwtild_t*(1-nlt)))*(1-
nyu/nlss)/nalpha_t; % Dynamics of φ(t)
        nsigma_yt=nfey_t*nsigma_at/0.2837;

        npusai_t=((1-tau_k)*nrt*(1+kusai*nmt)/((1-tau_k)*nrt*(1+kusai*nmt)+(1-tau_w)*nwtild_t*(1-nlt)))*nomega_t-((1-tau_w)*nwtild_t*nlt/((1-
tau_k)*nrt*(1+kusai*nmt)+(1-tau_w)*nwtild_t*(1-nlt)))*(1-nyu/nlss)/nalpha_t; % Dynamics of ψ(t)
        nsigma_yft=npusai_t*nsigma_at/0.2544;

        nwtild=[nwtild;nwtild_t];
        nfey=[nfey;nfey_t];
        npusai=[npusai;npusai_t];

        nsigma_a=[nsigma_a;nsigma_at];
        nsigma_v=[nsigma_v;nsigma_vt];
        nsigma_y=[nsigma_y;nsigma_yt];
        nsigma_yf=[nsigma_yf;nsigma_yft];


end
```

```
%  g_I=4.5% (Government investment-GDP ratio=4.5%) and ξ=1.35 (Bonds-money ratio=1.35)

% Parameter values
tau_k=0.276; % Capital income tax rate
tau_w=0.224; % Labor income tax rate
tau_c=0.08;  % Consumption tax rate
g_I=0.045;   % Ratio of government investment to real GDP
g_C=0.150;   % Ratio of government consumption to real GDP
g_W=0;       % Ratio of wastful government expenditure to real GDP
beta=1.4;    % Weight of leisure in utility
etha=0.12;   % Weight of real money balances in utility
phai=0.22;   % Weight of government consumption in utility
share=0.6;   % Labor share in output
effic=0.9;   % TFP
rho=0.04;    % Rate of time preference
ganmma=-1.5; % Elasticity of intertemporal substitution in consumption
epsiron=0.6; % Geometric weight of average externalities derived from private capital
kusai=1.35;  % Bonds-money ratio
t_ss=0.0137; % Lump-sum-tax-wealth ratio



nobs=200;    % periods

% Steady state values
fun = @rootGT1;
x0 = [0.7,0.7];

param=[tau_k tau_w tau_c g_I g_C g_W beta etha phai share effic rho ganmma epsiron];

x = fsolve(fun,x0,optimset,param);

Izss=x(1); % Steady state ratio of public capital to private capital, z*
Ilss=x(2); % Steady state value of leisure, l*


% Balanced growth equilibrium values

Icss=((1-tau_w)/(1+tau_c))*share*effic*(1-Ilss)^(share-1)*Izss^(share*(1-epsiron))*Ilss/beta;  % Consumption-capital ratio, c*
Iyss=effic*(1-Ilss)^share*Izss^(share*(1-epsiron));                                           % Output-capital ratio, y*
(1-g_I-g_C-g_W)*Iyss;                                                                          % (Consumption+investment)/capital
Irss=(1-share)*effic*(1-Ilss)^share*Izss^(share*(1-epsiron));                                 % Before-tax return on private capital, r*
(1-tau_k)*Irss;                                                                                % After-tax return on private capital, (1-tau_k)r*
IPai=1-ganmma-etha*ganmma-phai*ganmma;                                                         % Π in (12c)
IGss=((1-tau_k)*Irss-rho)/IPai;                                                                % Balanced growth rate
Imss=(((1+etha)*tau_c+etha)*Icss+(tau_k*(1-share)+tau_w*share-g_I-g_C-g_W)*Iyss-t_ss)/((t_ss+(1-1/IPai)*(1-tau_k)*Irss+rho/IPai)*(1+kusai)); % Real
money balances-capital ratio, m*
Imss/Icss;                                                                                     % Money-consumption ratio
Itheta_ss=(etha*(1+tau_c)*Icss/Imss-((1-1/IPai)*(1-tau_k)*Irss+rho/IPai));                     % Money growth rate
Iinfl=etha*(1+tau_c)*Icss/Imss-(1-tau_k)*Irss;                                                 % Inflation rate
IPiketty=(IPai-1)*(1-tau_k)*Irss/IPai-rho/IPai;                                                % (1-tau_k)rss-Gss


% Local stability
Itheta_L=((1-share)*(1-ganmma-phai*ganmma)+phai*ganmma)*Ilss/(1-Ilss)+(1-ganmma-beta*ganmma);  % Δ in (12c)

Iy_z=share*(1-epsiron)*Iyss/Izss;              % dy/dz
Iy_l=-share*Iyss/(1-Ilss);                     % dy/dl

Ic_z=(1-epsiron)*share*Icss/Izss;              % dc/dz
Ic_l=((1-share)*Ilss/(1-Ilss)+1)*Icss/Ilss;    % dc/dl

Ir_z=share*(1-epsiron)*Irss/Izss;              % dr/dz
Ir_l=-share*Irss/(1-Ilss);                     % dr/dl

IG_k=(1-g_I-g_C-g_W)*Iyss-Icss;                           % Growth rate of private capital, G_k
IG_kp=g_I*effic*(1-Ilss)^share*Izss^(share*(1-epsiron)-1); % Growth rate of public capital, G_kp

IG_kl=-share*(1-g_I-g_C-g_W)*Iyss/(1-Ilss)-((1-share)*Ilss/(1-Ilss)+1)*Icss/Ilss; % d(G_k)/dl
IG_kz=share*(1-epsiron)*IG_k/Izss;                                                % d(G_k)/dz

IG_kpz=-(1-share*(1-epsiron))*IG_kp/Izss;      % d(G_kp)/dz
IG_kpl=-share*IG_kp/(1-Ilss);                  % d(G_kp)/dl
```

```
% Elements of (15)
Ia_31=Imss*((g_I+g_C-(1-share)*tau_k-share*tau_w)*Iy_l+(1-tau_k)*Ir_l*(1+kusai)*Imss-(tau_c+etha*(1+tau_c))*Ic_l)/((1+kusai)*Imss)-IG_kl*Imss; % a_31
Ia_32=Imss*((g_I+g_C-(1-share)*tau_k-share*tau_w)*Iy_z+(1-tau_k)*Ir_z*(1+kusai)*Imss-(tau_c+etha*(1+tau_c))*Ic_z)/((1+kusai)*Imss)-IG_kz*Imss; % a_32
Ia_33=-((g_I+g_C-(1-share)*tau_k-share*tau_w)*Iyss-(tau_c+etha*(1+tau_c))*Icss+t_ss)/((1+kusai)*Imss);                                        % a_33

Ia_21=(IG_kpl-IG_kl)*Izss;      % a_21
Ia_22=(IG_kpz-IG_kz)*Izss;      % a_22
Ia_23=0;                        % a_23

Ia_11=(etha*ganmma*Ia_31/Imss-IPai*IG_kl-share*(1-epsiron)*(1-ganmma-phai*ganmma)*Ia_21/Izss+(1-tau_k)*Ir_l)*(Ilss/Itheta_L); % a_11
Ia_12=(etha*ganmma*Ia_32/Imss-IPai*IG_kz-share*(1-epsiron)*(1-ganmma-phai*ganmma)*Ia_22/Izss+(1-tau_k)*Ir_z)*(Ilss/Itheta_L); % a_12
Ia_13=(etha*ganmma*Ia_33/Imss)*(Ilss/Itheta_L);                                                                               % a_13

IA=[Ia_11 Ia_12 Ia_13; Ia_21 Ia_22 Ia_23; Ia_31 Ia_32 Ia_33];    % Jacobian in (15)
Ie=eig(IA);                                                      % Three eigenvalues in the Jacobian

% Saddle path
IMeig=sort(Ie);
Ilambda=diag(IMeig);
Ilambda(1,1);                                                    % Unique stable root

IA_1=(Ilambda(1,1)-Ia_22)/Ia_21;                                 % Coefficient of saddle path of leisure
IA_2=Ia_32+Ia_31*IA_1;                                           % Coefficient of saddle path of money, Numerator
IA_3=Ilambda(1,1)-Ia_33;                                         % Coefficient of saddle path of money, Denominator

Iza=0.5759;                         % A value of z(0) equal to pre-shock value, Public capital-private capital ratio
  Iz=[]; Iz=[Iz;0.5759];
Ila=Ilss+IA_1*(Iza-Izss);           % A value of l(0)
  Il=[]; Il=[Il;Ila];
Ima=Imss+(IA_2/IA_3)*(Iza-Izss);    % A value of m(0)
  Im=[]; Im=[Im;Ima];
Ica=((1-tau_w)/(1+tau_c))*share*effic*(1-Ila)^(share-1)*Iza^(share*(1-epsiron))*Ila/beta;  % A value of c(0)
  Ic=[]; Ic=[Ic;Ica];
Ira=(1-share)*effic*(1-Ila)^share*Iza^(share*(1-epsiron));                                % A value of r(0)
  Ir=[]; Ir=[Ir;Ira];
Iinfl_a=etha*(1+tau_c)*Ica/Ima-(1-tau_k)*Ira;                                             % A value of π(0)
  Iinfl=[]; Iinfl=[Iinfl;Iinfl_a];

Iya=effic*(1-Ila)^share*Iza^(share*(1-epsiron));                                          % A value of y(0)
  Iy=[]; Iy=[Iy;Iya];
IG_ka=(1-g_I-g_C-g_W)*Iya-Ica;                                                            % Growth rate of private capital in period 0
  IG_k=[]; IG_k=[IG_k;IG_ka];
IG_kpa=g_I*Iya/Iza;                                                                       % Growth rate of public capital in period 0
  IG_kp=[]; IG_kp=[IG_kp;IG_kpa];
Itheta_a=((g_I+g_C+g_W-(1-share)*tau_k-share*tau_w)*Iya-(tau_c-kusai*etha*(1+tau_c))*Ica+(1+(1+kusai)*Ima)*t_ss)/((1+kusai)*Ima); % Money growth rate in period 0
  Itheta=[]; Itheta=[Itheta;Itheta_a];
IG_la=(Ila/Itheta_L)*(etha*ganmma*(Itheta-Iinfl_a-IG_ka)-IPai*IG_ka-share*(1-epsiron)*(1-ganmma-phai*ganmma)*(IG_kpa-IG_ka)+(1-tau_k)*Ira-rho); % Growth rate of leisure in period 0
  IG_l=[]; IG_l=[IG_l;IG_la];
IG_ya=-share*(IG_la/(1-Ila))+share*(1-epsiron)*IG_kpa+(1-share*(1-epsiron))*IG_ka;        % Grwoth rate of real GDP in period 0
  IG_y=[]; IG_y=[IG_y;IG_ya];
IPiketa=(1-tau_k)*Ira-IG_ya;                                                              % (1-tau_k)r-G_y in period 0
  IPiket=[]; IPiket=[IPiket;IPiketa];
IG_wa=((1+kusai)*Ima/(1+(1+kusai)*Ima))*(Itheta-Iinfl_a)+(1/(1+(1+kusai)*Ima))*IG_ka;      % Grwoth rate of wealth A(0) in period 0
  IG_w=[]; IG_w=[IG_w;IG_wa];


% Inequality in a balnaced growth path
nyu=beta/(1+beta+etha);                                          % ν in (17)
Iwss_tild=share*effic*(1-Ilss)^(share-1)*Izss^(share*(1-epsiron)); % w*/K*, Real wage-private capital ratio in a balanced growth
Iw0_tild=share*effic*(1-Ila)^(share-1)*Iza^(share*(1-epsiron));    % w(0)/K(0), Real wage-private capital ratio in period 0
Iwtild=[]; Iwtild=[Iwtild;Iw0_tild];

Ialpha_a=1+(1-tau_w)*(Iwss_tild/(1+(1+kusai)*Imss))*(1-Ila/Ilss)/(-Ilambda(1,1)-(1-tau_w)*(Iwss_tild/(1+(1+kusai)*Imss))*(1-Ilss/nyu));             % A value of α(0) in (D-4);
Ialpha=[]; Ialpha=[Ialpha;Ialpha_a];

Iomega_a=1+(Ima/(1+kusai*Ima))*(Ialpha_a-1+nyu/Ilss)/Ialpha_a;                                                                   % A value of ω(0) in (D-6), Coefficient of (D-6)
Iomega=[]; Iomega=[Iomega;Iomega_a];
```

```
Ifey_a=(Ira*(1+kusai*Ima)/(Ira*(1+kusai*Ima)+Iw0_tild*(1-Ila)))*Iomega_a-(Iw0_tild*Ila/(Ira*(1+kusai*Ima)+Iw0_tild*(1-Ila)))*(1-
nyu/Ilss)/Ialpha_a; % A value of φ(0) in (D-8a)
Ifey=[]; Ifey=[Ifey;Ifey_a];

Ipusai_a=((1-tau_k)*Ira*(1+kusai*Ima)/((1-tau_k)*Ira*(1+kusai*Ima)+(1-tau_w)*Iw0_tild*(1-Ila)))*Iomega_a-((1-tau_w)*Iw0_tild*Ila/((1-
tau_k)*Ira*(1+kusai*Ima)+(1-tau_w)*Iw0_tild*(1-Ila)))*(1-nyu/Ilss)/Ialpha_a; % A value of ψ(0), Coefficient of after-tax income inequality
Ipusai=[]; Ipusai=[Ipusai;Ipusai_a];

Ikapper=0.406;                                                                          % (bonds+money)/wealth in the benchmark
parameter values

Isigma_aa=1+((2*Ikapper-1)*(1-Ikapper)*Ikapper/((1-Ikapper)^2+Ikapper^2))*((1+kusai)*Ima/0.6835-1);     % After-shock value of σ_a(0)
Isigma_ass=Isigma_aa/Ialpha_a                                                           % Balanced growth value of σ_a, i.e.,
 σ_a*
Isigma_a=[]; Isigma_a=[Isigma_a;Isigma_aa];

Isigma_va=Iomega_a*Isigma_aa/1.1634;                                                    % A value of σ_v(0) relative to the
benchmark in period 0
Isigma_v=[]; Isigma_v=[Isigma_v;Isigma_va];

Isigma_ya=Ifey_a*Isigma_aa/0.2837;                                                      % A value of σ_y(0) relative to the
benchmark in period 0
Isigma_y=[]; Isigma_y=[Isigma_y;Isigma_ya];

Isigma_yfa=Ipusai_a*Isigma_aa/0.2544;                                                   % A value of σ_ya(0) relative to the
benchmark in period 0
Isigma_yf=[]; Isigma_yf=[Isigma_yf;Isigma_yfa];


% Transitional dynamics of average variables and standard deviations

nobs=200;

for t=1:nobs

        Izt=Izss+exp(Ilambda(1,1))*(Iza-Izss);      % Dynamics of z(t)
        Iza=Izt;
        Iz=[Iz;Izt];

        Ilt=Ilss+exp(Ilambda(1,1))*(Ila-Ilss);      % Dynamics of l(t)
        Ila=Ilt;
        Il=[Il;Ilt];

        Imt=Imss+exp(Ilambda(1,1))*(Ima-Imss);      % Dynamics of m(t)
        Ima=Imt;
        Im=[Im;Imt];

        Ict=((1-tau_w)/(1+tau_c))*share*effic*(1-Ilt)^(share-1)*Izt^(share*(1-epsiron))*Ilt/beta;  % Dynamics of c(t)
        Ic=[Ic;Ict];

        Irt=(1-share)*effic*(1-Ilt)^share*Izt^(share*(1-epsiron));                             % Dynamics of r(t)
        Ir=[Ir;Irt];

        Iinfl_t=etha*(1+tau_c)*Ict/Imt-(1-tau_k)*Irt;                                          % Dynamics of inflation rate
        Iinfl=[Iinfl;Iinfl_t];

        Iyt=effic*(1-Ilt)^share*Izt^(share*(1-epsiron));                                       % Dynamics of real GDP-capital ratio, y(t)
        Iy=[Iy;Iyt];

        IG_kt=(1-g_I-g_C-g_W)*Iyt-Ict;              % Growth rate of private capital in period t
        IG_k=[IG_k;IG_kt];

        IG_kpt=g_I*Iyt/Izt;                         % Growth rate of public capital in period t
        IG_kp=[IG_kp;IG_kpt];

        Itheta_t=((g_I+g_C+g_W-(1-share)*tau_k-share*tau_w)*Iyt-(tau_c-kusai*etha*(1+tau_c))*Ict+(1+(1+kusai)*Imt)*t_ss)/((1+kusai)*Imt); % Money
growth rate in period t
        Itheta=[Itheta;Itheta_t];

        IG_lt=(Ilt/Itheta_L)*(etha*ganmma*(Itheta_t-Iinfl_t-IG_kt)-IPai*IG_kt-share*(1-epsiron)*(1-ganmma-phai*ganmma)*(IG_kpt-IG_kt)+(1-
tau_k)*Irt-rho); % dl^dot/dt
        IG_l=[IG_l;IG_lt];

        IG_yt=-share*(IG_lt/(1-Ilt))+share*(1-epsiron)*IG_kpt+(1-share*(1-epsiron))*IG_kt;        % Grwoth rate of real GDP
```

```
        IG_y=[IG_y;IG_yt];

        IPiket_t=(1-tau_k)*Irt-IG_yt;                                              % (1-tau_k)r-G_y
        IPiket=[IPiket;IPiket_t];

        IG_wt=((1+kusai)*Imt/(1+(1+kusai)*Imt))*(Itheta_t-Iinfl_t)+(1/(1+(1+kusai)*Imt))*IG_kt;    % Grwoth rate of wealth A(t)
        IG_w=[IG_w;IG_wt];

        Ialpha_t=1+(1-tau_w)*(Iwss_tild/(1+(1+kusai)*Imss))*(1-Ilt/Ilss)/(-Ilambda(1,1)-(1-tau_w)*(Iwss_tild/(1+(1+kusai)*Imss))*(1-Ilss/nyu)); %
Dynamics of α(t);
        Ialpha=[Ialpha;Ialpha_t];

        Isigma_at=Ialpha_t*Isigma_ass;                                             % Dynamics of σ_a(t)



        Iomega_t=1+(Imt/(1+kusai*Imt))*(Ialpha_t-1+nyu/Ilss)/Ialpha_t;             % Dynamics of ω(t)
        Iomega=[Iomega;Iomega_t];

        Isigma_vt=Iomega_t*Isigma_at/1.1634;                                       % Dynamics of σ_v(t) relative to the benchmark
value

        Iwtild_t=share*effic*(1-Ilt)^(share-1)*Izt^(share*(1-epsiron));            % Dynamics of wtild

        Ifey_t=(Irt*(1+kusai*Imt)/(Irt*(1+kusai*Imt)+Iwtild_t*(1-Ilt)))*Iomega_t-(Iwtild_t*Ilt/(Irt*(1+kusai*Imt)+Iwtild_t*(1-Ilt)))*(1-
nyu/Ilss)/Ialpha_t; % Dynamics of φ(t)
        Isigma_yt=Ifey_t*Isigma_at/0.2837;

        Ipusai_t=((1-tau_k)*Irt*(1+kusai*Imt)/((1-tau_k)*Irt*(1+kusai*Imt)+(1-tau_w)*Iwtild_t*(1-Ilt)))*Iomega_t-((1-tau_w)*Iwtild_t*Ilt/((1-
tau_k)*Irt*(1+kusai*Imt)+(1-tau_w)*Iwtild_t*(1-Ilt)))*(1-nyu/Ilss)/Ialpha_t; % Dynamics of ψ(t)
        Isigma_yft=Ipusai_t*Isigma_at/0.2544;

        Iwtild=[Iwtild;Iwtild_t];
        Ifey=[Ifey;Ifey_t];
        Ipusai=[Ipusai;Ipusai_t];

        Isigma_a=[Isigma_a;Isigma_at];
        Isigma_v=[Isigma_v;Isigma_vt];
        Isigma_y=[Isigma_y;Isigma_yt];
        Isigma_yf=[Isigma_yf;Isigma_yft];



end



%  g_I=4.5% (Government investment-GDP ratio=4.5%) and ξ=1.10 (Bonds-money ratio=1.35)

% Parameter values
tau_k=0.276; % Capital income tax rate
tau_w=0.224; % Labor income tax rate
tau_c=0.08;  % Consumption tax rate
g_I=0.045;   % Ratio of government investment to output
g_C=0.150;   % Ratioo of government consumption to output
g_W=0;       % Ratio of wastful government expenditure to output
beta=1.4;    % Weight of leisure in utility
etha=0.12;   % Weight of real balances in utility
phai=0.22;   % Weight of government consumption in utility
share=0.6;   % Labor share in output
effic=0.9;   % TFP
rho=0.04;    % Rate of time preference
ganmma=-1.5; % Elasticity of intertemporal substitution in consumption
epsiron=0.6; % Geometric weight of average externalities derived from private capital
kusai=1.10;  % Bonds-money ratio
t_ss=0.0137; % Lump-sum-tax-wealth ratio



nobs=200;    % periods

% Steady state values of z and l
fun = @rootGT1;
x0 = [0.7,0.7];

param=[tau_k tau_w tau_c g_I g_C g_W beta etha phai share effic rho ganmma epsiron];
```

```
x = fsolve(fun,x0,optimset,param);

lnzss=x(1); % Steady state ratio of public capital to private capital, z*
lnlss=x(2); % Steady state value of leisure, l*


% Balanced growth equilibrium values

lncss=((1-tau_w)/(1+tau_c))*share*effic*(1-lnlss)^(share-1)*lnzss^(share*(1-epsiron))*lnlss/beta;  % Consumption-capital ratio, c*
lnyss=effic*(1-lnlss)^share*lnzss^(share*(1-epsiron));                                            % Output-capital ratio, y*
(1-g_I-g_C-g_W)*lnyss;
lnrss=(1-share)*effic*(1-lnlss)^share*lnzss^(share*(1-epsiron));                                  % Before-tax return on private capital, r*
(1-tau_k)*lnrss;                                                                                  % After-tax return on private capital
lnPai=1-ganmma-etha*ganmma-phai*ganmma;                                                           % Π in (12c)
lnGss=((1-tau_k)*lnrss-rho)/lnPai;                                                                % Balanced growth rate
lnmss=(((1+etha)*tau_c+etha)*lncss+(tau_k*(1-share)+tau_w*share-g_I-g_C-g_W)*lnyss-t_ss)/((t_ss+(1-1/lnPai)*(1-
tau_k)*lnrss+rho/lnPai)*(1+kusai)); % Real balances-capital ratio, m*
lnmss/lncss;                                                                                      % Money-bonnds ratio
lntheta_ss=(etha*(1+tau_c)*lncss/lnmss-((1-1/lnPai)*(1-tau_k)*lnrss+rho/lnPai));                  % Money growth rate
lninfl=etha*(1+tau_c)*lncss/lnmss-(1-tau_k)*lnrss;                                                % Inflation rate
lnPiketty=(lnPai-1)*(1-tau_k)*lnrss/lnPai-rho/lnPai;                                              % (1-tau_k)rss-Gss


% Local stability
lntheta_L=((1-share)*(1-ganmma-phai*ganmma)+phai*ganmma)*lnlss/(1-lnlss)+(1-ganmma-beta*ganmma);   % Δ in (12c)

lny_z=share*(1-epsiron)*lnyss/lnzss;              % dy/dz
lny_l=-share*lnyss/(1-lnlss);                     % dy/dl

lnc_z=(1-epsiron)*share*lncss/lnzss;              % dc/dz
lnc_l=((1-share)*lnlss/(1-lnlss)+1)*lncss/lnlss;  % dc/dl

lnr_z=share*(1-epsiron)*lnrss/lnzss;              % dr/dz
lnr_l=-share*lnrss/(1-lnlss);                     % dr/dl

lnG_k=(1-g_I-g_C-g_W)*lnyss-lncss;                          % Growth rate of private capital
lnG_kp=g_I*effic*(1-lnlss)^share*lnzss^(share*(1-epsiron)-1); % Growth rate of Public capital

lnG_kl=-share*(1-g_I-g_C-g_W)*lnyss/(1-lnlss)-((1-share)*lnlss/(1-lnlss)+1)*lncss/lnlss; % d(G_k)/dl
lnG_kz=share*(1-epsiron)*lnG_k/lnzss;                                                   % d(G_k)/dz

lnG_kpz=-(1-share*(1-epsiron))*lnG_kp/lnzss;      % d(G_kp)/dz
lnG_kpl=-share*lnG_kp/(1-lnlss);                  % d(G_kp)/dl


% Elements of (15)
lna_31=lnmss*((g_I+g_C-(1-share)*tau_k-share*tau_w)*lny_l+(1-tau_k)*lnr_l*(1+kusai)*lnmss-(tau_c+etha*(1+tau_c))*lnc_l)/((1+kusai)*lnmss)-
lnG_kl*lnmss; % a_31
lna_32=lnmss*((g_I+g_C-(1-share)*tau_k-share*tau_w)*lny_z+(1-tau_k)*lnr_z*(1+kusai)*lnmss-(tau_c+etha*(1+tau_c))*lnc_z)/((1+kusai)*lnmss)-
lnG_kz*lnmss; % a_32
lna_33=-((g_I+g_C-(1-share)*tau_k-share*tau_w)*lnyss-
(tau_c+etha*(1+tau_c))*lncss+t_ss)/((1+kusai)*lnmss);                                             % a_33

lna_21=(lnG_kpl-lnG_kl)*lnzss;                % a_21
lna_22=(lnG_kpz-lnG_kz)*lnzss;                % a_22
lna_23=0;                                     % a_23

lna_11=(etha*ganmma*lna_31/lnmss-lnPai*lnG_kl-share*(1-epsiron)*(1-ganmma-phai*ganmma)*lna_21/lnzss+(1-tau_k)*lnr_l)*(lnlss/lntheta_L);    % a_11
lna_12=(etha*ganmma*lna_32/lnmss-lnPai*lnG_kz-share*(1-epsiron)*(1-ganmma-phai*ganmma)*lna_22/lnzss+(1-tau_k)*lnr_z)*(lnlss/lntheta_L);    % a_12
lna_13=(etha*ganmma*lna_33/lnmss)*(lnlss/lntheta_L);                                                                                       % a_13

lnA=[lna_11 lna_12 lna_13; lna_21 lna_22 lna_23; lna_31 lna_32 lna_33];   % Jacobian in (15)
lne=eig(lnA);                                                             % Three eigenvalues in the Jacobian

% Saddle path
lnMeig=sort(lne);
lnlambda=diag(lnMeig);
lnlambda(1,1);                                                            % Unique stable root

lnA_1=(lnlambda(1,1)-lna_22)/lna_21;                                      % Coefficient of saddle path of leisure
lnA_2=lna_32+lna_31*lnA_1;                                                % Coefficient of saddle path of money, Numerator
lnA_3=lnlambda(1,1)-lna_33;                                               % Coefficient of saddle path of money, Denominator

lnza=0.5759;                          % A value of z(0) equal to pre-shock value, Public capital-private capital ratio
  lnz=[]; lnz=[lnz;0.5759];
lnla=lnlss+lnA_1*(lnza-lnzss);        % A value of l(0)
```

```
  lnl=[]; lnl=[lnl;lnla];
lnma=lnmss+(lnA_2/lA_3)*(lnza-lnzss);  % A value of m(0)
  lnm=[]; lnm=[lnm;lnma];
lnca=((1-tau_w)/(1+tau_c))*share*effic*(1-lnla)^(share-1)*lnza^(share*(1-epsiron))*lnla/beta;  % A value of c(0)
  lnc=[]; lnc=[lnc;lnca];
lnra=(1-share)*effic*(1-lnla)^share*lnza^(share*(1-epsiron));                              % A value of r(0)
  lnr=[]; lnr=[lnr;lnra];
lninfl_a=etha*(1+tau_c)*lnca/lnma-(1-tau_k)*lnra;                                             % A value of inflation rate in period 0
  lninfl=[]; lninfl=[lninfl;lninfl_a];

lnya=effic*(1-lnla)^share*lnza^(share*(1-epsiron));                                          % A value of y(0)
  lny=[]; lny=[lny;lnya];
lnG_ka=(1-g_I-g_C-g_W)*lnya-lnca;     % Growth rate of privagte capital in period 0
  lnG_k=[]; lnG_k=[lnG_k;lnG_ka];
lnG_kpa=g_I*lnya/lnza;                % Growth rate of public capital in period 0
  lnG_kp=[]; lnG_kp=[lnG_kp;lnG_kpa];
lntheta_a=((g_I+g_C+g_W-(1-share)*tau_k-share*tau_w)*lnya-(tau_c-
kusai*etha*(1+tau_c))*lnca+(1+(1+kusai)*lnma)*t_ss)/((1+kusai)*lnma);                    % Money growth rate in period 0
  lntheta=[]; lntheta=[lntheta;lntheta_a];
lnG_la=(lnla/lntheta_L)*(etha*ganmma*(lntheta-lninfl_a-lnG_ka)-lnPai*lnG_ka-share*(1-epsiron)*(1-ganmma-phai*ganmma)*(lnG_kpa-lnG_ka)+(1-
tau_k)*lnra-rho); % Growth rate of leisure in period 0
  lnG_l=[]; lnG_l=[lnG_l;lnG_la];
lnG_ya=-share*(lnG_la/(1-lnla))+share*(1-epsiron)*lnG_kpa+(1-share*(1-epsiron))*lnG_ka;       % Grwoth rate of GDP in period 0
  lnG_y=[]; lnG_y=[lnG_y;lnG_ya];
lnPiketa=(1-tau_k)*lnra-lnG_ya;                                                               % (1-tau_k)r-G_y in period 0
  lnPiket=[]; lnPiket=[lnPiket;lPiketa];
lnG_wa=((1+kusai)*lnma/(1+(1+kusai)*lnma))*(lntheta-lninfl_a)+(1/(1+(1+kusai)*lnma))*lnG_ka;   % Grwoth rate of wealth in period 0
  lnG_w=[]; lnG_w=[lnG_w;lnG_wa];



% Inequality in a balnaced growth path
nyu=beta/(1+beta+etha);                                        % ν  in (17)
lnwss_tild=share*effic*(1-lnlss)^(share-1)*lnzss^(share*(1-epsiron)); % w*/K*, Real wage-private capital ratio in a balanced growth
lnw0_tild=share*effic*(1-lnla)^(share-1)*lnza^(share*(1-epsiron));    % wtild in period 0
lnwtild=[]; lnwtild=[lnwtild;lnw0_tild];

lnalpha_a=1+(1-tau_w)*(lnwss_tild/(1+(1+kusai)*lnmss))*(1-lnla/lnlss)/(-lnlambda(1,1)-(1-tau_w)*(lnwss_tild/(1+(1+kusai)*lnmss))*(1-lnlss/nyu)); %
A value of  α(0);
lnalpha=[]; lnalpha=[lnalpha;lnalpha_a];

lnomega_a=1+(lnma/(1+kusai*lnma))*(lnalpha_a-1+nyu/lnlss)/lnalpha_a;                                                                        %
A value of  ω(0)
lnomega=[]; lnomega=[lnomega;lnomega_a];

lnfey_a=(lnra*(1+kusai*lnma)/(lnra*(1+kusai*lnma)+lnw0_tild*(1-lnla)))*lnomega_a-(lnw0_tild*lnla/(lnra*(1+kusai*lnma)+lnw0_tild*(1-lnla)))*(1-
nyu/lnlss)/lnalpha_a; % A value of  ϕ(0)
lnfey=[]; lnfey=[lnfey;lnfey_a];

lnpusai_a=((1-tau_k)*lnra*(1+kusai*lnma)/((1-tau_k)*lnra*(1+kusai*lnma)+(1-tau_w)*lnw0_tild*(1-lnla)))*lnomega_a-((1-tau_w)*lnw0_tild*lnla/((1-
tau_k)*lnra*(1+kusai*lnma)+(1-tau_w)*lnw0_tild*(1-lnla)))*(1-nyu/lnlss)/lnalpha_a; % A value of  ψ(0)
lnpusai=[]; lnpusai=[lnpusai;lnpusai_a];

lnkapper=0.406;                                                                                          % (bonds+money)/wealth in the
benchmark parameter values

lnsigma_aa=1+((2*lnkapper-1)*(1-lnkapper)*lnkapper/((1-lnkapper)^2+lnkapper^2))*((1+kusai)*lnma/0.6835-1);     % After-shock value of  σ_a(0)
lnsigma_ass=lnsigma_aa/lnalpha_a;                                                                        % Balanced growth value of  σ_a,
i.e.,  σ_a*
lnsigma_a=[]; lnsigma_a=[lnsigma_a;lnsigma_aa];

lnsigma_va=lnomega_a*lnsigma_aa/1.1634;          % A value of  σ_v(0)
lnsigma_v=[]; lnsigma_v=[lnsigma_v;lnsigma_va];

lnsigma_ya=lnfey_a*lnsigma_aa/0.2837;            % A value of  σ_y(0)
lnsigma_y=[]; lnsigma_y=[lnsigma_y;lnsigma_ya];

lnsigma_yfa=lnpusai_a*lnsigma_aa/0.2544;         % A value of  σ_ya(0)
lnsigma_yf=[]; lnsigma_yf=[lnsigma_yf;lnsigma_yfa];


% Transitional dynamics of average variables and standard deviations

nobs=200;
```

```
for t=1:nobs

        lnzt=lnzss+exp(lnlambda(1,1))*(lnza-lnzss);    % Dynamics of z(t)
        lnza=lnzt;
        lnz=[lnz;lnzt];

        lnlt=lnlss+exp(lnlambda(1,1))*(lnla-lnlss);    % Dynamics of l(t)
        lnla=lnlt;
        lnl=[lnl;lnlt];

        lnmt=lnmss+exp(lnlambda(1,1))*(lnma-lnmss);    % Dynamics of m(t)
        lnma=lnmt;
        lnm=[lnm;lnmt];

        lnct=((1-tau_w)/(1+tau_c))*share*effic*(1-lnlt)^(share-1)*lnzt^(share*(1-epsiron))*lnlt/beta;   % Dynamics of c(t)
        lnc=[lnc;lnct];

        lnrt=(1-share)*effic*(1-lnlt)^share*lnzt^(share*(1-epsiron));                                    % Dynamics of r(t)
        lnr=[lnr;lnrt];

        lninfl_t=etha*(1+tau_c)*lnct/lnmt-(1-tau_k)*lnrt;                                                % Dynamics of inflation rate
        lninfl=[lninfl;lninfl_t];

        lnyt=effic*(1-lnlt)^share*lnzt^(share*(1-epsiron));                                              % Dynamics of y(t)
        lny=[lny;lnyt];

        lnG_kt=(1-g_I-g_C-g_W)*lnyt-lnct;              % Growth rate of private capital
        lnG_k=[lnG_k;lnG_kt];

        lnG_kpt=g_I*lnyt/lnzt;                         % Growth rate of public capital
        lnG_kp=[lnG_kp;lnG_kpt];

        lntheta_t=((g_I+g_C+g_W-(1-share)*tau_k-share*tau_w)*lnyt-(tau_c-kusai*etha*(1+tau_c))*lnct+(1+(1+kusai)*lnmt)*t_ss)/((1+kusai)*lnmt); %
Money growth rate in period t
        lntheta=[lntheta;lntheta_t];

        lnG_lt=(lnlt/lntheta_L)*(etha*ganmma*(lntheta_t-lninfl_t-lnG_kt)-lnPai*lnG_kt-share*(1-epsiron)*(1-ganmma-phai*ganmma)*(lnG_kpt-lnG_kt)+(1-
tau_k)*lnrt-rho); % dl^dot/dt
        lnG_l=[lnG_l;lnG_lt];

        lnG_yt=-share*(lnG_lt/(1-lnlt))+share*(1-epsiron)*lnG_kpt+(1-share*(1-epsiron))*lnG_kt;         % Grwoth rate of GDP
        lnG_y=[lnG_y;lnG_yt];

        lnPiket_t=(1-tau_k)*lnrt-lnG_yt;                                                                  % (1-tau_k)r-G_y
        lnPiket=[lnPiket;lnPiket_t];

        lnG_wt=((1+kusai)*lnmt/(1+(1+kusai)*lnmt))*(lntheta_t-lninfl_t)+(1/(1+(1+kusai)*lnmt))*lnG_kt;   % Grwoth rate of wealth
        lnG_w=[lnG_w;lnG_wt];

        lnalpha_t=1+(1-tau_w)*(lnwss_tild/(1+(1+kusai)*lnmss))*(1-lnlt/lnlss)/(-lnlambda(1,1)-(1-tau_w)*(lnwss_tild/(1+(1+kusai)*lnmss))*(1-
lnlss/nyu)); % Dynamics of α(t);
        lnalpha=[lnalpha;lnalpha_t];

        lnsigma_at=lnalpha_t*lnsigma_ass;                                       % Dynamics of σ_a(t)



        lnomega_t=1+(lnmt/(1+kusai*lnmt))*(lnalpha_t-1+nyu/lnlss)/lnalpha_t; % Dynamics of ω(t)
        lnomega=[lnomega;lnomega_t];

        lnsigma_vt=lnomega_t*lnsigma_at/1.1634;                                 % Dynamics of σ_v(t) relative to the benchmark value

        lnwtild_t=share*effic*(1-lnlt)^(share-1)*lnzt^(share*(1-epsiron));

        lnfey_t=(lnrt*(1+kusai*lnmt)/(lnrt*(1+kusai*lnmt)+lnwtild_t*(1-lnlt)))*lnomega_t-(lnwtild_t*lnlt/(lnrt*(1+kusai*lnmt)+lnwtild_t*(1-
lnlt)))*(1-nyu/lnlss)/lnalpha_t; % Dynamics of φ(t)
        lnsigma_yt=lnfey_t*lnsigma_at/0.2837;                                   % Dynamics of σ_y(t) relative to the benchmark value

        lnpusai_t=((1-tau_k)*lnrt*(1+kusai*lnmt)/((1-tau_k)*lnrt*(1+kusai*lnmt)+(1-tau_w)*lnwtild_t*(1-lnlt)))*lnomega_t-((1-
tau_w)*lnwtild_t*lnlt/((1-tau_k)*lnrt*(1+kusai*lnmt)+(1-tau_w)*lnwtild_t*(1-lnlt)))*(1-nyu/lnlss)/lnalpha_t; % Dynamics of ψ(t)
        lnsigma_yft=lnpusai_t*lnsigma_at/0.2544;                                % Dynamics of σ_yf(t) relative to teh benchmark value

        lnwtild=[lnwtild;lnwtild_t];
        lnfey=[lnfey;lnfey_t];
        lnpusai=[lnpusai;lnpusai_t];
```

```
        Insigma_a=[Insigma_a;Insigma_at];
        Insigma_v=[Insigma_v;Insigma_vt];
        Insigma_y=[Insigma_y;Insigma_yt];
        Insigma_yf=[Insigma_yf;Insigma_yft];


end







%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%Graphs
figure;
hold on


subplot(5,2,1)
plot([Iinfl(1:50),Ininfl(1:50)]);
title('1. Inflation');
legend(' ξ=1.35',' ξ=1.1');
xlabel('time');

subplot(5,2,2)
plot([infl(1:50),ninfl(1:50)]);
title('2. Inflation');
legend(' ξ=1.35',' ξ=1.1');
xlabel('time');

subplot(5,2,3)
plot([IG_y(1:50),InG_y(1:50)]);
title('3. Growth rate of income');
legend(' ξ=1.35',' ξ=1.1');
xlabel('time');

subplot(5,2,4)
plot([G_y(1:150),nG_y(1:150)]);
title('4. Growth rate of income');
legend(' ξ=1.35',' ξ=1.1');
xlabel('time');

subplot(5,2,5)
plot([Isigma_a(1:50),Insigma_a(1:50)]);
title('5. Stand. dev. of total wealth');
xlabel('time');
legend(' ξ=1.35',' ξ=1.1');

subplot(5,2,6)
plot([sigma_a(1:50),nsigma_a(1:50)]);
title('6. Stand. dev. of total wealth');
xlabel('time');
legend(' ξ=1.35',' ξ=1.1');

subplot(5,2,7)
plot([Isigma_v(1:50),Insigma_v(1:50)]);
title('7. Stand. dev. of income-earning assets');
xlabel('time');
legend(' ξ=1.35',' ξ=1.1');

subplot(5,2,8)
plot([sigma_v(1:50),nsigma_v(1:50)]);
title('8. Stand. dev. of income-earning assets');
xlabel('time');
legend(' ξ=1.35',' ξ=1.1');

subplot(5,2,9)
plot([Isigma_y(1:50),Insigma_y(1:50)]);
title('9. Stand. dev. of before-tax income');
xlabel('time');
```

```
legend('ξ=1.35','ξ=1.1' );

subplot(5,2,10)
plot([sigma_y(1:50),nsigma_y(1:50)]);
title('10. Stand. dev. of before-tax income');
legend('ξ=1.35','ξ=1.1');
xlabel('time');


hold off
```