附 录

正文未报告部分

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########################################
Code for Lin, Chen, Chen, and Chen (2020)
########################################

# parameter definition
deltaK1=0.12
deltaH=0.05
deltaR=0.09
beta=0.97
epsilon=0.88
sigmaC=1.1
sigmaH=1.15
rho=-0.015
tao1=0.05
alpha1=0.51
phi1=0.5
phiB=0.5
kappa=1
kappaH=1
xi=0.5
A1=1
L1=1
Treport=20

# AI related parameters
alphahigh<-0.78
alphalow<-0.51
ghigh<-0.08
zeta=0.04
eta<-0.1
gamma<- 76
mu<-48

# cycle number of intial value
ncount=1
IHBGP=1.428958*23/133.0538
CBGP=3.197509*23/133.0538

########################################
## noAI
```

```
# dynamic
source("DGEF.R")

gy=0.04
x=1
term=5
while(term!=1&&term!=2&&term!=4&& x<=ncount){
y=1
while(term!=1 && term!=2&&term!=4&& y<=ncount){
lowerK <- K1*(1+gy)
upperK <- K1*x
lowerH <- H1*(1+xi*gy)
upperH <- H1*y
lowerIH<-IHBGP*(2/xi)
upperIH<-IHBGP*y
lowerC<-CBGP
upperC<-CBGP*y

init <- c(seq(lowerK, upperK, length.out = T), seq(lowerH, upperH, length.out = T))
for (t in 2:T) {
init[t]=init[t-1]*(1+gy)
init[T+t]=init[T+t-1]*(1+xi*gy)
#init[2*T+t]=init[2*T+t-1]*(1+2/xi*gy)
#init[3*T+t]=init[2*T+t-1]*(1+gy)
      }

results <- nleqslv(init, DGEF, method="Newton", global="gline")$x
term<- nleqslv(init, DGEF)$termcd
value<- nleqslv(init, DGEF)$fvec
y=y+1
}
x=x+1
}


K=c(K1, results[1:(length(results)/2)])
H=c(H1, results[(1*length(results)/2+1):(2*length(results)/2)])

C=numeric(length = Treport )
R=numeric(length = Treport )
Y=numeric(length = Treport )
IK=numeric(length = Treport )
IH=numeric(length = Treport )
```

```
interY=numeric(length = Treport )
r=numeric(length = Treport )
rK=numeric(length = Treport )
mH=numeric(length = Treport )
IR=numeric(length = Treport )
e=numeric(length = Treport )
b=numeric(length = Treport )
R[1]=R1

for (t in 1:(Treport)) {
interY[t]=alpha[t]^(1-rho)*K[t]^rho+(1-alpha[t])^(1-rho)*(A[t]*L[t])^rho;
Y[t]=(interY[t])^(epsilon/rho)*R[t]^(1-epsilon)
IK[t]=K[t+1]-(1-deltaK[t])*K[t]
IH[t]=(H[t+1]-(1-deltaH)*H[t])^(1/xi)
C[t]=epsilon*(1-tao[t])*Y[t]-IK[t]-IH[t]
R[t+1]=(1-deltaR)*R[t]+(tao[t]*epsilon+1-epsilon)*Y[t]
r[t]=alpha[t]^(1-rho)*epsilon*interY[t]^(epsilon/rho-1)*K[t]^(rho-1)*R[t]^(1-epsilon)-deltaK[t]
e[t]=phi[t]*(C[t]^sigmaC)/(H[t]^sigmaH)-deltaH
b[t]=(1-epsilon)*(interY[t])^(epsilon/rho)*R[t]^(-epsilon)-deltaR
rK[t]=epsilon*interY[t]^(epsilon/rho-1)*K[t]^(rho-1)*R[t]^(1-epsilon)
mH[t]=phi[t]*H[t]^(-sigmaH)
IR[t]=tao[t]*Y[t]
        }
K=K[1:Treport]
H=H[1:Treport]

CnoAI=C

#############################################################################
## AI


# dynamic
source("AIDGEF.R")

x=1
term=5
while(term!=1&&term!=2&&term!=4&& x<=ncount){
y=1
while(term!=1 && term!=2&&term!=4&& y<=ncount){
lowerK <- K1*(1+gy)
upperK <- K1*x
lowerH <- H1*(1+xi*gy)
upperH <- H1*y
```

```
lowerIH<-IHBGP*(2/xi)
upperIH<-IHBGP*y
lowerC<-CBGP
upperC<-CBGP*y

gy20=0.05
init <- c(seq(lowerK, upperK, length.out = T), seq(lowerH, upperH, length.out = T))
for (t in 2:T) {
init[t]=init[t-1]*(1+gy20)
init[T+t]=init[T+t-1]*(1+xi*gy20)
#init[2*T+t]=init[2*T+t-1]*(1+2/xi*gy)
#init[3*T+t]=init[2*T+t-1]*(1+gy)
      }

results <- nleqslv(init, AIDGEF, method="Newton", global="gline")$x
term<- nleqslv(init, AIDGEF)$termcd
value<- nleqslv(init, AIDGEF)$fvec
y=y+1
}
x=x+1
}


K=c(K1, results[1:(length(results)/2)])
H=c(H1, results[(1*length(results)/2+1):(2*length(results)/2)])



C=numeric(length = Treport )
R=numeric(length = Treport )
Y=numeric(length = Treport )
IK=numeric(length = Treport )
IH=numeric(length = Treport )
interY=numeric(length = Treport )
r=numeric(length = Treport )
rK=numeric(length = Treport )
mH=numeric(length = Treport )
IR=numeric(length = Treport )
e=numeric(length = Treport )
b=numeric(length = Treport )
R[1]=R1

for (t in 1:(Treport)) {
interY[t]=alpha[t]^(1-rho)*K[t]^rho+(1-alpha[t])^(1-rho)*(A[t]*L[t])^rho;
```

```
Y[t]=(interY[t])^(epsilon/rho)*R[t]^(1-epsilon)
IK[t]=K[t+1]-(1-deltaK[t])*K[t]
IH[t]=(H[t+1]-(1-deltaH)*H[t])^(1/xi)
C[t]=epsilon*(1-tao[t])*Y[t]-IK[t]-IH[t]
R[t+1]=(1-deltaR)*R[t]+(tao[t]*epsilon+1-epsilon)*Y[t]
r[t]=alpha[t]^(1-rho)*epsilon*interY[t]^(epsilon/rho-1)*K[t]^(rho-1)*R[t]^(1-epsilon)-deltaK[t]
e[t]=phi[t]*(C[t]^sigmaC)/(H[t]^sigmaH)-deltaH
b[t]=(1-epsilon)*(interY[t])^(epsilon/rho)*R[t]^(-epsilon)-deltaR
rK[t]=epsilon*interY[t]^(epsilon/rho-1)*K[t]^(rho-1)*R[t]^(1-epsilon)
mH[t]=phi[t]*H[t]^(-sigmaH)
IR[t]=tao[t]*Y[t]
      }
K=K[1:Treport]
H=H[1:Treport]
CAI=C
```