## Sample size: 1993Q2:2016Q1

# **Observables:** $\mathbf{Y}$ , $\mathbf{R}$ , $\Pi_c$ , $\Pi_d$ , $\mathbf{C}$ , $I_d$ , $\mathbf{N}$

## Prior for $\omega = 0.35$ , adjustment costs

### 2 million draws

# Chain 1: 25.9431% Chain 2: 25.9551%

# Log data density: -1089.906880

#### Tables

Table 1: Structural parameters estimations

	Prior mean	Prior Variance	Posterior Mean	Posterior LB	Posterior UB
sigma	1.00	0.01	1.14	1.00	1.29
$_{\rm phi}$	2.00	0.01	1.95	1.79	2.12
h	0.40	0.00	0.25	0.20	0.30
omega	0.35	0.00	0.19	0.14	0.24
rhor	0.75	0.00	0.78	0.74	0.82
$_{\rm phip}$	2.00	0.01	2.06	1.90	2.22
$_{\rm phiy}$	0.20	0.01	0.22	0.08	0.36
thetac	0.75	0.00	0.66	0.61	0.72
thetad	0.65	0.00	0.54	0.49	0.59
iotac	0.50	0.01	0.31	0.18	0.44
iotad	0.50	0.01	0.35	0.20	0.49
nud	0.83	0.01	1.06	0.91	1.22
rhoac	0.50	0.01	0.51	0.45	0.58
rhoad	0.50	0.01	0.50	0.34	0.67
rhocstar	0.50	0.01	0.92	0.89	0.95
rhomuc	0.50	0.01	0.39	0.28	0.51
rhomud	0.50	0.01	0.95	0.95	0.95
rhogamma	0.50	0.01	0.74	0.63	0.85

	Prior mean	Posterior Mean	Posterior LB	Posterior UB
eac	1.00	2.53	2.22	2.84
ead	1.00	16.22	13.57	18.85
em	1.00	0.24	0.20	0.27
ecstar	1.00	1.46	1.23	1.69
emuc	1.00	1.45	1.14	1.75
emud	1.00	2.83	1.88	3.74
eg	1.00	2.86	2.36	3.34

Table 2: Shock parameters estimations

Table 3: Standard deviations

	Data	Model
у	1.00	6.00
R	0.41	0.66
pic	0.47	0.89
pid	1.94	3.04
c	1.02	3.65
id	8.33	107.52
n	1.49	3.62

 Table 4: Correlations

y,y1.001.00y,R-0.390.26y,pic-0.260.13y,pid0.030.01y,c0.50-0.67y,id0.610.89y,n0.110.79R,y-0.390.26R,R1.001.00R,pic0.310.54R,pid-0.110.29R,c-0.22-0.56R,id-0.420.25R,n-0.230.22pic,y-0.260.13pic,R0.310.54ic,pic1.001.00ic,pid-0.110.28pic,c-0.14-0.25pic,id-0.170.16pic,n0.090.26pid,y0.030.01pid,R-0.110.28id,pid1.001.00pid,d0.33-0.00pid,d0.33-0.00pid,n0.320.16c,y0.50-0.67c,R-0.22-0.56c,pic-0.14-0.25c,pid0.340.02c,c1.001.00c,d,pid0.33-0.00pid,d0.33-0.07c,d0.50-0.71c,n0.19-0.52id,pid0.33-0.00id,pid0.33-0.00id,qid0.33-0.02c,c1.001.00id,n0.530.86n,y0		Data	Model
y,R $-0.39$ $0.26$ y,pic $-0.26$ $0.13$ y,pid $0.03$ $0.01$ y,c $0.50$ $-0.67$ y,id $0.61$ $0.89$ y,n $0.11$ $0.79$ R,y $-0.39$ $0.26$ R,R $1.00$ $1.00$ R,pic $0.31$ $0.54$ R,pid $-0.11$ $0.29$ R,c $-0.22$ $-0.56$ R,id $-0.42$ $0.22$ pic,y $-0.23$ $0.22$ pic,k $0.31$ $0.54$ ic,pic $1.00$ $1.00$ ic,pic $1.00$ $1.00$ ic,pic $1.00$ $1.00$ pic,c $-0.14$ $-0.25$ pic,id $-0.17$ $0.16$ pic,n $0.09$ $0.26$ pid,y $0.03$ $0.01$ pid,R $-0.11$ $0.28$ id,pid $1.00$ $1.00$ pid,k $-0.11$ $0.28$ id,pid $1.00$ $1.00$ pid,k $-0.11$ $0.28$ id,pid $1.00$ $1.00$ pid,n $0.32$ $0.16$ c,pid $0.34$ $0.02$ pid,id $0.33$ $-0.00$ pid,k $-0.14$ $-0.25$ c,pid $0.34$ $0.02$ pid,h $0.32$ $-0.67$ c,R $-0.22$ $-0.56$ c,pic $-0.14$ $-0.25$ id,pic $-0.17$ $0.16$ odd,pid $0.33$ $-0.00$ pid,k $-0.42$ $0.25$ <t< td=""><td>y,y</td><td>1.00</td><td>1.00</td></t<>	y,y	1.00	1.00
y,pic $-0.26$ $0.13$ y,pid $0.03$ $0.01$ y,c $0.50$ $-0.67$ y,id $0.61$ $0.89$ y,n $0.11$ $0.79$ R,y $-0.39$ $0.26$ R,R $1.00$ $1.00$ R,pic $0.31$ $0.54$ R,pid $-0.11$ $0.29$ R,c $-0.22$ $-0.56$ R,id $-0.42$ $0.25$ R,n $-0.23$ $0.22$ pic,y $-0.26$ $0.13$ pic,R $0.31$ $0.54$ ic,pic $1.00$ $1.00$ ic,pid $-0.11$ $0.28$ pic,c $-0.14$ $-0.25$ pic,id $-0.17$ $0.16$ pic,n $0.09$ $0.26$ pid,R $-0.11$ $0.29$ id,pid $1.00$ $1.00$ pid,c $0.34$ $0.02$ pid,id $0.33$ $-0.00$ pid,n $0.32$ $0.16$ c,y $0.50$ $-0.67$ c,R $-0.22$ $-0.56$ c,pic $-0.14$ $-0.25$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,id $0.50$ $-0.71$ c,n $0.19$ $-0.52$ id,pid $0.33$ $-0.00$ id,pid $0.33$ $-0.00$ id,n $0.53$ $0.86$ n,y $0.11$ $0.79$ n,R $-0.23$ $0.22$ n,pic $0.09$ $0.26$ n,pic $0.09$ $0.26$ n,pic<	y,R	-0.39	0.26
y,pid $0.03$ $0.01$ y,c $0.50$ $-0.67$ y,id $0.61$ $0.89$ y,n $0.11$ $0.79$ R,y $-0.39$ $0.26$ R,R $1.00$ $1.00$ R,pic $0.31$ $0.54$ R,pid $-0.11$ $0.29$ R,c $-0.22$ $-0.56$ R,id $-0.42$ $0.25$ R,n $-0.23$ $0.22$ pic,y $-0.26$ $0.13$ pic,R $0.31$ $0.54$ ic,pic $1.00$ $1.00$ ic,pid $-0.11$ $0.28$ pic,c $-0.14$ $-0.25$ pic,id $-0.17$ $0.16$ pic,n $0.09$ $0.26$ pid,k $-0.11$ $0.28$ id,pid $1.00$ $1.00$ pid,c $0.34$ $0.02$ pid,id $0.33$ $-0.00$ pid,n $0.32$ $0.16$ c,y $0.50$ $-0.67$ c,R $-0.22$ $-0.56$ c,pic $-0.14$ $-0.25$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,d,m $0.19$ $-0.52$ id,y $0.61$ $0.89$ id,R $-0.42$ $0.25$ id,pid $0.33$ $-0.00$ id,pid $0.33$ $-0.00$ id,qid $0.33$ $-0.00$ id,qid $0.33$ $-0.02$ n,nic $0.17$ $0.16$ id,pid $0.33$ $-0.02$ n,pic $0.09$ $0.26$ n	y,pic	-0.26	0.13
y,c $0.50$ $-0.67$ y,id $0.61$ $0.89$ y,n $0.11$ $0.79$ R,y $-0.39$ $0.26$ R,R $1.00$ $1.00$ R,pic $0.31$ $0.54$ R,pid $-0.11$ $0.29$ R,c $-0.22$ $-0.56$ R,id $-0.42$ $0.25$ R,n $-0.23$ $0.22$ pic,y $-0.26$ $0.13$ pic,R $0.31$ $0.54$ ic,pic $1.00$ $1.00$ ic,pid $-0.11$ $0.28$ pic,c $-0.14$ $-0.25$ pic,id $-0.17$ $0.16$ pic,n $0.09$ $0.26$ pid,y $0.03$ $0.01$ pid,R $-0.11$ $0.28$ id,pid $1.00$ $1.00$ pid,r $0.32$ $0.16$ c,y $0.50$ $-0.67$ c,R $-0.22$ $-0.56$ c,pic $-0.14$ $-0.25$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ pid,n $0.32$ $0.16$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,n $0.19$ $-0.52$ id,pid $0.33$ $-0.00$ id,pid $0.33$ $-0.00$ id,pid $0.33$ $-0.00$ id,pid $0.33$ $-0.00$ id,pid $0.32$ $0.16$ n,pic $0.09$ $0.26$ n,pic $0.09$ $0.26$ n,pic $0.09$ $0.26$ n,pic </td <td>y,pid</td> <td>0.03</td> <td>0.01</td>	y,pid	0.03	0.01
y,id $0.61$ $0.89$ y,n $0.11$ $0.79$ R,y $-0.39$ $0.26$ R,R $1.00$ $1.00$ R,pic $0.31$ $0.54$ R,pid $-0.11$ $0.29$ R,c $-0.22$ $-0.56$ R,id $-0.42$ $0.25$ R,n $-0.23$ $0.22$ pic,y $-0.26$ $0.13$ pic,R $0.31$ $0.54$ ic,pic $1.00$ $1.00$ ic,pid $-0.11$ $0.28$ pic,c $-0.14$ $-0.25$ pic,id $-0.17$ $0.16$ pic,n $0.09$ $0.26$ pid,R $-0.11$ $0.29$ id,pid $1.00$ $1.00$ pid,R $-0.11$ $0.28$ id,pid $1.00$ $1.00$ pid,c $0.34$ $0.02$ pid,id $0.33$ $-0.00$ pid,n $0.32$ $0.16$ c,y $0.50$ $-0.67$ c,R $-0.22$ $-0.56$ c,pic $-0.14$ $-0.25$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,id $0.50$ $-0.71$ id,pid $0.33$ $-0.00$ id,pid $0.33$ $-0.00$ id,pid $0.33$ $-0.00$ id,pid $0.33$ $-0.00$ id,pid $0.32$ $0.16$ n,pic $0.09$ $0.26$ n,pic $0.09$ $0.26$ n,pic $0.09$ $0.26$ n,pid $0.32$ $0.16$ <td< td=""><td>v,c</td><td>0.50</td><td>-0.67</td></td<>	v,c	0.50	-0.67
y,n $0.11$ $0.79$ R,y $-0.39$ $0.26$ R,R $1.00$ $1.00$ R,pic $0.31$ $0.54$ R,pic $0.31$ $0.54$ R,pid $-0.11$ $0.29$ R,c $-0.22$ $-0.56$ R,id $-0.42$ $0.25$ R,n $-0.23$ $0.22$ pic,y $-0.26$ $0.13$ pic,R $0.31$ $0.54$ ic,pic $1.00$ $1.00$ ic,pid $-0.11$ $0.28$ pic,c $-0.14$ $-0.25$ pic,id $-0.17$ $0.16$ pic,n $0.09$ $0.26$ pid,y $0.03$ $0.01$ pid,R $-0.11$ $0.28$ id,pid $1.00$ $1.00$ pid,c $0.34$ $0.02$ pid,id $0.33$ $-0.00$ pid,n $0.32$ $0.16$ c,y $0.50$ $-0.67$ c,R $-0.22$ $-0.56$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,id $0.50$ $-0.71$ c,hid $0.50$ $-0.71$ id,pid $0.33$ $-0.00$ id,r $0.53$ $0.86$ n,y $0.11$ $0.79$ n,R $-0.23$ $0.22$ n,pic $0.09$ $0.26$ n,pid $0.32$ $0.16$ n,pid $0.32$ $0.16$ n,pid $0.32$ $0.16$ n,pid $0.32$ $0.16$	v,id	0.61	0.89
R,y $-0.39$ $0.26$ R,R $1.00$ $1.00$ R,pic $0.31$ $0.54$ R,pid $-0.11$ $0.29$ R,c $-0.22$ $-0.56$ R,id $-0.42$ $0.25$ R,n $-0.23$ $0.22$ pic,y $-0.26$ $0.13$ pic,R $0.31$ $0.54$ ic,pic $1.00$ $1.00$ ic,pid $-0.11$ $0.28$ pic,c $-0.14$ $-0.25$ pic,id $-0.17$ $0.16$ pic,n $0.09$ $0.26$ pid,k $-0.11$ $0.29$ id,pid $1.00$ $1.00$ pid,c $0.34$ $0.02$ pid,id $0.33$ $-0.00$ pid,n $0.32$ $0.16$ c,y $0.50$ $-0.67$ c,R $-0.22$ $-0.56$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ pid,r $-0.14$ $-0.25$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,id $0.50$ $-0.71$ id,pid $0.33$ $-0.00$ id,r $-0.42$ $0.25$ id,pid $0.33$ $-0.00$ id,n $0.53$ $0.86$ n,y $0.11$ $0.79$ n,R $-0.23$ $0.22$ n,pic $0.09$ $0.26$ n,pid $0.32$ $0.16$ n,pid $0.32$ $0.16$ n,pid $0.32$ $0.16$ n,pid $0.32$ $0.16$	v.n	0.11	0.79
R,R1.001.00R,pic0.310.54R,pid-0.110.29R,c-0.22-0.56R,id-0.420.25R,n-0.230.22pic,y-0.260.13pic,R0.310.54ic,pic1.001.00ic,pid-0.110.28pic,c-0.14-0.25pic,id-0.170.16pic,n0.090.26pid,y0.030.01pid,R-0.110.29id,pid1.001.00pid,c0.340.02pid,id0.33-0.00pid,n0.320.16c,y0.50-0.67c,R-0.22-0.56c,pid0.340.02c,c1.001.00c,kd0.50-0.71c,n0.19-0.52id,pid0.33-0.00id,r-0.420.25id,pid0.33-0.00id,r0.530.86n,y0.110.79n,R-0.230.22n,pic0.090.26n,pid0.320.16n,pid0.320.16n,pid0.320.16n,pid0.320.16n,pid0.320.16n,pid0.320.16n,pid0.320.16n,pid0.320.16n,pid0.320.16n,pid	Ř.v	-0.39	0.26
R,pic $0.31$ $0.54$ R,pid $-0.11$ $0.29$ R,c $-0.22$ $-0.56$ R,id $-0.42$ $0.25$ R,n $-0.23$ $0.22$ pic,y $-0.26$ $0.13$ pic,R $0.31$ $0.54$ ic,pic $1.00$ $1.00$ ic,pid $-0.11$ $0.28$ pic,c $-0.14$ $-0.25$ pic,id $-0.17$ $0.16$ pic,n $0.09$ $0.26$ pid,R $-0.11$ $0.29$ id,pid $1.00$ $1.00$ pid,R $-0.11$ $0.29$ id,pid $1.00$ $1.00$ pid,c $0.34$ $0.02$ pid,id $0.33$ $-0.00$ pid,n $0.32$ $0.16$ c,y $0.50$ $-0.67$ c,R $-0.22$ $-0.56$ c,pic $-0.14$ $-0.25$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,id $0.50$ $-0.71$ id,pid $0.33$ $-0.00$ id,r $-0.42$ $0.25$ id,pid $0.33$ $-0.00$ id,r $0.23$ $0.22$ n,k $-0.23$ $0.22$ n,pic $0.09$ $0.26$ n,pid $0.32$ $0.16$	R.R	1.00	1.00
R,pid $-0.11$ $0.29$ R,c $-0.22$ $-0.56$ R,id $-0.42$ $0.25$ R,n $-0.23$ $0.22$ pic,y $-0.26$ $0.13$ pic,R $0.31$ $0.54$ ic,pic $1.00$ $1.00$ ic,pid $-0.11$ $0.28$ pic,c $-0.14$ $-0.25$ pic,id $-0.17$ $0.16$ pic,n $0.09$ $0.26$ pid,y $0.03$ $0.01$ pid,R $-0.11$ $0.28$ id,pid $1.00$ $1.00$ pid,k $-0.11$ $0.28$ id,pid $1.00$ $1.00$ pid,k $-0.11$ $0.28$ id,pid $1.00$ $1.00$ pid,c $0.34$ $0.02$ pid,id $0.33$ $-0.00$ pid,n $0.32$ $0.16$ c,pic $-0.14$ $-0.25$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,id $0.50$ $-0.71$ c,n $0.19$ $-0.52$ id,pid $0.33$ $-0.00$ id,r $0.53$ $0.86$ n,y $0.11$ $0.79$ n,R $-0.23$ $0.22$ n,pic $0.09$ $0.26$ n,pid $0.32$ $0.16$ n,pid $0.32$ $0.16$ n,pid $0.32$ $0.16$ n,pid $0.32$ $0.16$	R.pic	0.31	0.54
R,c $-0.22$ $-0.56$ $R,id$ $-0.42$ $0.25$ $R,n$ $-0.23$ $0.22$ $pic,y$ $-0.26$ $0.13$ $pic,R$ $0.31$ $0.54$ $ic,pic$ $1.00$ $1.00$ $ic,pid$ $-0.11$ $0.28$ $pic,c$ $-0.14$ $-0.25$ $pic,id$ $-0.17$ $0.16$ $pic,n$ $0.09$ $0.26$ $pid,y$ $0.03$ $0.01$ $pid,R$ $-0.11$ $0.29$ $id,pid$ $1.00$ $1.00$ $pid,c$ $0.34$ $0.02$ $pid,id$ $0.33$ $-0.00$ $pid,n$ $0.32$ $0.16$ $c,y$ $0.50$ $-0.67$ $c,R$ $-0.22$ $-0.56$ $c,pic$ $-0.14$ $-0.25$ $c,pid$ $0.34$ $0.02$ $c,c$ $1.00$ $1.00$ $c,d,y$ $0.50$ $-0.71$ $c,n$ $0.19$ $-0.52$ $id,pid$ $0.33$ $-0.00$ $id,pid$ $0.33$ $-0.00$ $id,pid$ $0.33$ $-0.00$ $id,pid$ $0.33$ $-0.00$ $id,n$ $0.53$ $0.86$ $n,y$ $0.12$ $0.26$ $n,pid$ $0.32$ $0.16$ $n,pid$ $0.32$ $0.16$ $n,pid$ $0.53$ $0.86$	R.pid	-0.11	0.29
R,id $-0.42$ $0.25$ R,n $-0.23$ $0.22$ pic,y $-0.26$ $0.13$ pic,R $0.31$ $0.54$ pic,pic $1.00$ $1.00$ ic,pid $-0.11$ $0.28$ pic,c $-0.14$ $-0.25$ pic,id $-0.17$ $0.16$ pic,n $0.09$ $0.26$ pid,y $0.03$ $0.01$ pid,R $-0.11$ $0.29$ id,pid $1.00$ $1.00$ pid,R $-0.11$ $0.28$ id,pid $1.00$ $1.00$ pid,c $0.34$ $0.02$ pid,id $0.33$ $-0.00$ pid,n $0.32$ $0.16$ c,y $0.50$ $-0.67$ c,R $-0.22$ $-0.56$ c,pic $-0.14$ $-0.25$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,id $0.50$ $-0.71$ c,n $0.19$ $-0.52$ id,pid $0.33$ $-0.00$ id,pid $0.33$ $-0.00$ id,pid $0.33$ $-0.00$ id,pid $0.32$ $0.16$ n,pic $0.09$ $0.26$ n,pic $0.09$ $0.26$ n,pid $0.32$ $0.16$	R.c	-0.22	-0.56
R,n $-0.23$ $0.22$ pic,y $-0.26$ $0.13$ pic,R $0.31$ $0.54$ ic,pic $1.00$ $1.00$ ic,pid $-0.11$ $0.28$ pic,c $-0.14$ $-0.25$ pic,id $-0.17$ $0.16$ pic,n $0.09$ $0.26$ pid,y $0.03$ $0.01$ pid,R $-0.11$ $0.29$ id,pid $1.00$ $1.00$ pid,c $0.34$ $0.02$ pid,id $0.32$ $0.16$ c,y $0.50$ $-0.67$ c,R $-0.22$ $-0.56$ c,pic $-0.14$ $-0.25$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,id $0.50$ $-0.71$ c,n $0.19$ $-0.52$ id,y $0.61$ $0.89$ id,R $-0.42$ $0.25$ id,pid $0.33$ $-0.00$ id,pid $0.33$ $-0.00$ id,c $0.50$ $-0.71$ id,pid $0.33$ $-0.00$ id,n $0.53$ $0.86$ n,y $0.11$ $0.79$ n,R $-0.23$ $0.22$ n,pid $0.32$ $0.16$ n,pid $0.32$ $0.16$ n,pid $0.32$ $0.16$ n,pid $0.53$ $0.86$ n,n $1300$ $1.00$	R.id	-0.42	0.25
pic,y $-0.26$ $0.13$ pic,R $0.31$ $0.54$ ic,pic $1.00$ $1.00$ ic,pid $-0.11$ $0.28$ pic,c $-0.14$ $-0.25$ pic,id $-0.17$ $0.16$ pic,n $0.09$ $0.26$ pid,y $0.03$ $0.01$ pid,R $-0.11$ $0.29$ id,pic $-0.11$ $0.29$ id,pid $1.00$ $1.00$ pid,c $0.34$ $0.02$ pid,id $0.33$ $-0.00$ pid,n $0.32$ $0.16$ c,y $0.50$ $-0.67$ c,R $-0.22$ $-0.56$ c,pic $-0.14$ $-0.25$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,id $0.50$ $-0.71$ c,n $0.19$ $-0.52$ id,pid $0.33$ $-0.00$ id,pid $0.33$ $-0.00$ id,pid $0.33$ $-0.00$ id,pid $0.33$ $-0.00$ id,n $0.53$ $0.86$ n,y $0.11$ $0.79$ n,R $-0.23$ $0.22$ n,pic $0.09$ $0.26$ n,pid $0.32$ $0.16$ n,pid $0.32$ $0.16$ n,pid $0.53$ $0.86$ n,pid $0.53$ $0.86$	Ŕ.n	-0.23	0.22
pic, R $0.31$ $0.54$ $pic, R$ $1.00$ $1.00$ $ic, pic$ $1.00$ $1.00$ $ic, pic$ $1.01$ $0.28$ $pic, c$ $-0.14$ $-0.25$ $pic, id$ $-0.17$ $0.16$ $pic, n$ $0.09$ $0.26$ $pid, y$ $0.03$ $0.01$ $pid, R$ $-0.11$ $0.29$ $id, pic$ $-0.11$ $0.28$ $id, pid$ $1.00$ $1.00$ $pid, c$ $0.34$ $0.02$ $pid, id$ $0.33$ $-0.00$ $pid, n$ $0.32$ $0.16$ $c, y$ $0.50$ $-0.67$ $c, R$ $-0.22$ $-0.56$ $c, pic$ $-0.14$ $-0.25$ $c, pid$ $0.34$ $0.02$ $c, c$ $1.00$ $1.00$ $c, d$ $0.50$ $-0.71$ $c, n$ $0.19$ $-0.52$ $id, y$ $0.61$ $0.89$ $id, R$ $-0.42$ $0.25$ $id, pid$ $0.33$ $-0.00$ $id, pid$ $0.33$ $-0.00$ $id, pid$ $0.33$ $-0.00$ $id, n$ $0.53$ $0.86$ $n, y$ $0.11$ $0.79$ $n, R$ $-0.23$ $0.22$ $n, pid$ $0.32$ $0.16$ $n, pid$ $0.32$ $0.16$ $n, pid$ $0.53$ $0.86$	pic.v	-0.26	0.13
ic,pic1.001.00ic,pid-0.110.28pic,c-0.14-0.25pic,id-0.170.16pic,n0.090.26pid,y0.030.01pid,R-0.110.29id,pid1.001.00pid,c0.340.02pid,id0.33-0.00pid,n0.320.16c,y0.50-0.67c,R-0.22-0.56c,pid0.340.02c,c1.001.00c,id0.50-0.71c,pid0.340.02c,c1.001.00c,id0.50-0.71c,pid0.340.02id,y0.610.89id,R-0.420.25id,pic-0.170.16id,pid0.33-0.00id,c0.50-0.71id,id1.001.00id,n0.530.86n,y0.110.79n,R-0.230.22n,pic0.090.26n,pid0.320.16n,c0.19-0.52n,id0.530.86n,n1001.00	pic.R	0.31	0.54
$n_{1}$ $1.55$ $1.60$ $pic, pid$ $-0.11$ $0.28$ $pic, c$ $-0.14$ $-0.25$ $pic, id$ $-0.17$ $0.16$ $pic, n$ $0.09$ $0.26$ $pid, y$ $0.03$ $0.01$ $pid, R$ $-0.11$ $0.29$ $id, pic$ $-0.11$ $0.28$ $id, pid$ $1.00$ $1.00$ $pid, c$ $0.34$ $0.02$ $pid, id$ $0.33$ $-0.00$ $pid, n$ $0.32$ $0.16$ $c, y$ $0.50$ $-0.67$ $c, R$ $-0.22$ $-0.56$ $c, pic$ $-0.14$ $-0.25$ $c, pid$ $0.34$ $0.02$ $c, c$ $1.00$ $1.00$ $c, d$ $0.50$ $-0.71$ $c, n$ $0.19$ $-0.52$ $id, pid$ $0.33$ $-0.00$ $id, pid$ $0.32$ $0.26$ $n, pic$ $0.09$ $0.26$ $n, pid$ $0.32$ $0.16$ $n, c$ $0.19$ $-0.52$ $n, id$ $0.53$ $0.86$	pic.pic	1.00	1.00
pic,c $-0.14$ $-0.25$ pic,id $-0.17$ $0.16$ pic,n $0.09$ $0.26$ pid,y $0.03$ $0.01$ pid,R $-0.11$ $0.29$ id,pic $-0.11$ $0.28$ id,pid $1.00$ $1.00$ pid,c $0.34$ $0.02$ pid,id $0.33$ $-0.00$ pid,n $0.32$ $0.16$ c,y $0.50$ $-0.67$ c,R $-0.22$ $-0.56$ c,pic $-0.14$ $-0.25$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,id $0.50$ $-0.71$ c,n $0.19$ $-0.52$ id,y $0.61$ $0.89$ id,R $-0.42$ $0.25$ id,pid $0.33$ $-0.00$ id,pid $0.33$ $-0.00$ id,r $0.53$ $0.86$ n,y $0.11$ $0.79$ n,R $-0.23$ $0.22$ n,pic $0.09$ $0.26$ n,pid $0.32$ $0.16$ n,c $0.19$ $-0.52$ n,id $0.53$ $0.86$	pic.pid	-0.11	0.28
pic,id $-0.17$ $0.16$ pic,id $-0.17$ $0.16$ pic,in $0.09$ $0.26$ pid,y $0.03$ $0.01$ pid,R $-0.11$ $0.29$ id,pic $-0.11$ $0.28$ id,pid $1.00$ $1.00$ pid,c $0.34$ $0.02$ pid,id $0.33$ $-0.00$ pid,n $0.32$ $0.16$ c,y $0.50$ $-0.67$ c,R $-0.22$ $-0.56$ c,pic $-0.14$ $-0.25$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,id $0.50$ $-0.71$ c,n $0.19$ $-0.52$ id,y $0.61$ $0.89$ id,R $-0.42$ $0.25$ id,pid $0.33$ $-0.00$ id,pid $0.33$ $-0.00$ id,r $0.53$ $0.86$ n,y $0.11$ $0.79$ n,R $-0.23$ $0.22$ n,pic $0.09$ $0.26$ n,pid $0.32$ $0.16$ n,c $0.19$ $-0.52$ n,id $0.53$ $0.86$	pic.c	-0.14	-0.25
pic,n $0.09$ $0.26$ pid,y $0.03$ $0.01$ pid,R $-0.11$ $0.29$ id,pic $-0.11$ $0.28$ id,pid $1.00$ $1.00$ pid,c $0.34$ $0.02$ pid,id $0.33$ $-0.00$ pid,n $0.32$ $0.16$ c,y $0.50$ $-0.67$ c,R $-0.22$ $-0.56$ c,pic $-0.14$ $-0.25$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,id $0.50$ $-0.71$ c,n $0.19$ $-0.52$ id,y $0.61$ $0.89$ id,R $-0.42$ $0.25$ id,pid $0.33$ $-0.00$ id,c $0.50$ $-0.71$ id,pid $0.33$ $-0.00$ id,n $0.53$ $0.86$ n,y $0.11$ $0.79$ n,R $-0.23$ $0.22$ n,pic $0.09$ $0.26$ n,pid $0.32$ $0.16$ n,pid $0.33$ $0.86$ n,n $1300$ $1.00$	pic.id	-0.17	0.16
pid,y $0.03$ $0.01$ pid,R $-0.11$ $0.29$ id,pic $-0.11$ $0.29$ id,pid $1.00$ $1.00$ pid,c $0.34$ $0.02$ pid,id $0.33$ $-0.00$ pid,n $0.32$ $0.16$ c,y $0.50$ $-0.67$ c,R $-0.22$ $-0.56$ c,pic $-0.14$ $-0.25$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,id $0.50$ $-0.71$ c,n $0.19$ $-0.52$ id,y $0.61$ $0.89$ id,R $-0.42$ $0.25$ id,pid $0.33$ $-0.00$ id,c $0.50$ $-0.71$ id,pid $0.33$ $-0.00$ id,c $0.50$ $-0.71$ id,nid $1.00$ $1.00$ id,n $0.53$ $0.86$ n,y $0.11$ $0.79$ n,R $-0.23$ $0.22$ n,pic $0.09$ $0.26$ n,pid $0.32$ $0.16$ n,c $0.19$ $-0.52$ n,id $0.53$ $0.86$	pic.n	0.09	0.26
$r_{0,y}$ $r_{0,1}$ $r_{0,2}$ $pid,R$ $-0.11$ $0.29$ $id,pic$ $-0.11$ $0.28$ $id,pid$ $1.00$ $1.00$ $pid,c$ $0.34$ $0.02$ $pid,id$ $0.33$ $-0.00$ $pid,n$ $0.32$ $0.16$ $c,y$ $0.50$ $-0.67$ $c,R$ $-0.22$ $-0.56$ $c,pic$ $-0.14$ $-0.25$ $c,pid$ $0.34$ $0.02$ $c,c$ $1.00$ $1.00$ $c,id$ $0.50$ $-0.71$ $c,n$ $0.19$ $-0.52$ $id,y$ $0.61$ $0.89$ $id,R$ $-0.42$ $0.25$ $id,pid$ $0.33$ $-0.00$ $id,pid$ $0.33$ $-0.00$ $id,pid$ $0.33$ $-0.00$ $id,n$ $0.53$ $0.86$ $n,y$ $0.11$ $0.79$ $n,R$ $-0.23$ $0.22$ $n,pic$ $0.09$ $0.26$ $n,pid$ $0.32$ $0.16$ $n,c$ $0.19$ $-0.52$ $n,id$ $0.53$ $0.86$	pid.v	0.03	0.01
id, pic-0.110.28id, pid1.001.00pid, pid1.001.00pid, id0.33-0.00pid, id0.320.16c, y0.50-0.67c, R-0.22-0.56c, pic-0.14-0.25c, pid0.340.02c, c1.001.00c, id0.50-0.71c, n0.19-0.52id, y0.610.89id, R-0.420.25id, pid0.33-0.00id, pid0.33-0.00id, pid0.33-0.00id, n0.530.86n, y0.110.79n, R-0.230.22n, pic0.090.26n, pid0.320.16n, c0.19-0.52n, id0.530.86n, n1001.00	pid.R	-0.11	0.29
id, pid1.001.00pid, pid, c $0.34$ $0.02$ pid, id $0.33$ $-0.00$ pid, n $0.32$ $0.16$ c, y $0.50$ $-0.67$ c, R $-0.22$ $-0.56$ c, pic $-0.14$ $-0.25$ c, pid $0.34$ $0.02$ c, c $1.00$ $1.00$ c, id $0.50$ $-0.71$ c, n $0.19$ $-0.52$ id, y $0.61$ $0.89$ id, R $-0.42$ $0.25$ id, pid $0.33$ $-0.00$ id, pid $0.33$ $-0.00$ id, c $0.50$ $-0.71$ id, n $0.53$ $0.86$ n, y $0.11$ $0.79$ n, R $-0.23$ $0.22$ n, pic $0.09$ $0.26$ n, pid $0.32$ $0.16$ n, c $0.19$ $-0.52$ n, id $0.53$ $0.86$	pid.pic	-0.11	0.28
pid,c $0.34$ $0.02$ $pid,id$ $0.33$ $-0.00$ $pid,n$ $0.32$ $0.16$ $c,y$ $0.50$ $-0.67$ $c,R$ $-0.22$ $-0.56$ $c,pic$ $-0.14$ $-0.25$ $c,pid$ $0.34$ $0.02$ $c,c$ $1.00$ $1.00$ $c,id$ $0.50$ $-0.71$ $c,n$ $0.19$ $-0.52$ $id,y$ $0.61$ $0.89$ $id,R$ $-0.42$ $0.25$ $id,pid$ $0.33$ $-0.00$ $id,pid$ $0.33$ $-0.00$ $id,c$ $0.50$ $-0.71$ $id,id$ $1.00$ $1.00$ $id,n$ $0.53$ $0.86$ $n,y$ $0.11$ $0.79$ $n,R$ $-0.23$ $0.22$ $n,pic$ $0.09$ $0.26$ $n,pid$ $0.32$ $0.16$ $n,c$ $0.19$ $-0.52$ $n,id$ $0.53$ $0.86$	pid.pid	1.00	1.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	pid.c	0.34	0.02
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	pid,id	0.33	-0.00
c,y $0.50$ $-0.67$ c,R $-0.22$ $-0.56$ c,pic $-0.14$ $-0.25$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,id $0.50$ $-0.71$ c,n $0.19$ $-0.52$ id,y $0.61$ $0.89$ id,R $-0.42$ $0.25$ id,pic $-0.17$ $0.16$ id,pid $0.33$ $-0.00$ id,c $0.50$ $-0.71$ id,id $1.00$ $1.00$ id,n $0.53$ $0.86$ n,y $0.11$ $0.79$ n,R $-0.23$ $0.22$ n,pic $0.09$ $0.26$ n,pid $0.32$ $0.16$ n,c $0.19$ $-0.52$ n,id $0.53$ $0.86$ n n $100$	pid,n	0.32	0.16
c,R $-0.22$ $-0.56$ c,pic $-0.14$ $-0.25$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,id $0.50$ $-0.71$ c,n $0.19$ $-0.52$ id,y $0.61$ $0.89$ id,R $-0.42$ $0.25$ id,pic $-0.17$ $0.16$ id,pid $0.33$ $-0.00$ id,c $0.50$ $-0.71$ id,id $1.00$ $1.00$ id,n $0.53$ $0.86$ n,y $0.11$ $0.79$ n,R $-0.23$ $0.22$ n,pic $0.09$ $0.26$ n,pid $0.32$ $0.16$ n,c $0.19$ $-0.52$ n,id $0.53$ $0.86$ n n $1.00$	c,y	0.50	-0.67
c,pic $-0.14$ $-0.25$ c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,id $0.50$ $-0.71$ c,n $0.19$ $-0.52$ id,y $0.61$ $0.89$ id,R $-0.42$ $0.25$ id,pic $-0.17$ $0.16$ id,pid $0.33$ $-0.00$ id,c $0.50$ $-0.71$ id,id $1.00$ $1.00$ id,n $0.53$ $0.86$ n,y $0.11$ $0.79$ n,R $-0.23$ $0.22$ n,pic $0.09$ $0.26$ n,pid $0.32$ $0.16$ n,c $0.19$ $-0.52$ n,id $0.53$ $0.86$ n n $1.00$	c, R	-0.22	-0.56
c,pid $0.34$ $0.02$ c,c $1.00$ $1.00$ c,id $0.50$ $-0.71$ c,n $0.19$ $-0.52$ id,y $0.61$ $0.89$ id,R $-0.42$ $0.25$ id,pic $-0.17$ $0.16$ id,pid $0.33$ $-0.00$ id,c $0.50$ $-0.71$ id,id $1.00$ $1.00$ id,n $0.53$ $0.86$ n,y $0.11$ $0.79$ n,R $-0.23$ $0.22$ n,pic $0.09$ $0.26$ n,pid $0.32$ $0.16$ n,c $0.19$ $-0.52$ n,id $0.53$ $0.86$ n n $100$	c,pic	-0.14	-0.25
c,c $1.00$ $1.00$ c,id $0.50$ $-0.71$ c,n $0.19$ $-0.52$ id,y $0.61$ $0.89$ id,R $-0.42$ $0.25$ id,pic $-0.17$ $0.16$ id,pid $0.33$ $-0.00$ id,c $0.50$ $-0.71$ id,id $1.00$ $1.00$ id,n $0.53$ $0.86$ n,y $0.11$ $0.79$ n,R $-0.23$ $0.22$ n,pic $0.09$ $0.26$ n,pid $0.32$ $0.16$ n,c $0.19$ $-0.52$ n,id $0.53$ $0.86$ n,n $1.00$	c,pid	0.34	0.02
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	c,c	1.00	1.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	c,id	0.50	-0.71
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	ć,n	0.19	-0.52
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	id,y	0.61	0.89
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	id,R	-0.42	0.25
	id,pic	-0.17	0.16
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	id,pid	0.33	-0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	id,c	0.50	-0.71
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	id,id	1.00	1.00
$\begin{array}{ccccccc} n,y & 0.11 & 0.79 \\ n,R & -0.23 & 0.22 \\ n,pic & 0.09 & 0.26 \\ n,pid & 0.32 & 0.16 \\ n,c & 0.19 & -0.52 \\ n,id & 0.53 & 0.86 \\ n,n & 1300 & 1.00 \end{array}$	id,n	0.53	0.86
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	n,y	0.11	0.79
n,pic $0.09$ $0.26$ n,pid $0.32$ $0.16$ n,c $0.19$ $-0.52$ n,id $0.53$ $0.86$ n n $1300$ $1.00$	$^{n,R}$	-0.23	0.22
n,pid 0.32 0.16 n,c 0.19 -0.52 n,id 0.53 0.86 n n 1300 1.00	n,pic	0.09	0.26
n,c 0.19 -0.52 n,id 0.53 0.86 n n 1300 1.00	n,pid	0.32	0.16
n,id 0.53 0.86 n n 1300 1.00	n,c	0.19	-0.52
nn 1300 100	n,id	0.53	0.86
	n,n	1300	1.00

variable horizon eac ead emecstar emuc emud eg1 0.210.320.050.000.300.010.11у  $\mathbf{2}$ 0.200.410.020.010.230.060.0740.470.02 0.160.150.010.150.048 0.090.430.010.02 0.080.340.03 Inf 0.030.190.010.730.000.030.01R 1 0.050.070.020.290.110.140.32 $\mathbf{2}$ 0.09 0.24 0.28 0.050.010.180.1540.100.040.010.230.190.190.258 0.090.080.010.240.160.200.23Inf 0.060.140.010.200.110.330.161 0.070.09 0.220.20 pic 0.130.110.18 $\mathbf{2}$ 0.08 0.090.210.190.150.110.174 0.080.100.210.180.150.110.178 0.080.110.200.180.150.110.16Inf 0.08 0.120.190.170.150.140.151 pid 0.000.20 0.04 0.050.020.680.02 $\mathbf{2}$ 0.000.190.040.050.020.670.03 40.000.190.040.050.030.660.038 0.00 0.190.06 0.660.040.030.03Inf 0.00 0.190.030.060.030.660.03 $\mathbf{c}$ 1 0.050.020.020.570.250.040.05 $\mathbf{2}$ 0.070.030.020.520.280.040.044 0.06 0.080.010.500.250.060.048 0.04 0.140.470.120.010.180.03Inf 0.02 0.120.00 0.320.100.420.02  $\operatorname{id}$ 1 0.030.880.010.020.000.020.03 $\mathbf{2}$ 0.020.910.000.010.000.040.0240.010.840.130.000.000.010.018 0.010.650.000.000.010.320.010.00Inf 0.260.000.000.000.730.001 0.470.180.030.240.030.02n 0.03 $\mathbf{2}$ 0.370.160.030.030.350.030.034 0.270.290.020.020.320.060.028 0.180.370.010.010.210.190.020.070.22Inf 0.010.010.080.600.01

 Table 5: Variance decomposition

## FIGURES



Figure 1: Priors

Figure 2: Priors





Figure 3: Priors



Figure 4: Mode check plots

Figure 5: Mode check plots









Figure 7: MCMC univariate convergence diagnostic (Brooks and Gelman, 1998)



Figure 8: MCMC univariate convergence diagnostic (Brooks and Gelman, 1998)



Figure 9: MCMC univariate convergence diagnostic (Brooks and Gelman, 1998)



Figure 10: MCMC univariate convergence diagnostic (Brooks and Gelman, 1998)



Figure 11: MCMC univariate convergence diagnostic (Brooks and Gelman, 1998)

Figure 12: Convergence diagnostic





Figure 13: Convergence diagnostic



Figure 14: Convergence diagnostic



















Figure 19: Orthogonalized shock to  $e_{ac}\,$ 



Figure 20: Orthogonalized shock to  $e_{ac}\,$ 



Figure 21: Orthogonalized shock to  $e_{ad}$ 



Figure 22: Orthogonalized shock to  $e_{ad}$ 



Figure 23: Orthogonalized shock to  $\boldsymbol{e}_m$ 



Figure 24: Orthogonalized shock to  $e_{m}$ 



Figure 25: Orthogonalized shock to  $e_{cstar}$ 



Figure 26: Orthogonalized shock to  $e_{cstar}$ 



Figure 27: Orthogonalized shock to  $e_{muc}$ 



Figure 28: Orthogonalized shock to  $e_{muc}$ 



Figure 29: Orthogonalized shock to  $e_{mud}$ 



Figure 30: Orthogonalized shock to  $e_{mud}$ 



Figure 31: Orthogonalized shock to  $e_g\,$ 



Figure 32: Orthogonalized shock to  $e_g\,$ 

#### Figure 33: Smoothed shocks





Figure 34: Historical and smoothed variables



Figure 35: Historical Shock Decomposition: Output



Figure 36: Historical Shock Decomposition: Interest Rate



Figure 37: Historical Shock Decomposition: CPI Inflation



Figure 38: Historical Shock Decomposition: Housing Inflation



Figure 39: Historical Shock Decomposition: Consumption



Figure 40: Historical Shock Decomposition: Real Housing Investment



Figure 41: Historical Shock Decomposition: Employment