ModYUK Report: USVER1

November 8, 2010

The Model

```
!variables:transition

    LGDP, LGDP_BAR, Y, G, GROWTH, GROWTH4, GROWTH_BAR, GROWTH4_BAR
    PIELTE, PIE4
    UNR, UNR_BAR, UNR_G, UNR_GAP
    CAPU, CAPU_BAR, CU_G, CAPU_GAP

!shocks:transition

    RES_LGDP_BAR, RES_G, RES_Y
    RES_PIELTE, RES_PIE
    RES_UNR_BAR, RES_UNR_G, RES_UNR_GAP
    RES_CAPU_BAR, RES_CU_G, RES_CAPU_GAP

!parameters

    lab_share, tau, growth_ss, rho1, rho2
    beta, omega
    parhist, lambda, unr_ss, alpha, phi1, phi2
    delta, kappa1, kappa2

!equations:transition

    % Output.
    LGDP = LGDP_BAR + Y;
    LGDP_BAR = LGDP_BAR{-1} + G/4 + RES_LGDP_BAR
        - lab_share*(UNR_BAR - UNR_BAR{-1}) -(1-lab_share)*(UNR_BAR{-1} - UNR_BAR{-20})/19;
    G = (1-tau)*G{-1} + tau*growth_ss + RES_G;
    Y = rho1*Y{-1} - rho2/100*(PIE4{-1} - PIELTE{-1}) + RES_Y;
    GROWTH = 4*(LGDP - LGDP{-1});
    GROWTH4 = LGDP - LGDP{-4};
    GROWTH_BAR = 4*(LGDP_BAR - LGDP_BAR{-1});
    GROWTH4_BAR = LGDP_BAR - LGDP_BAR{-4};

    % Inflation.
    PIELTE = PIELTE{-1} + RES_PIELTE;
    PIE4 = PIE4{-1} + beta*Y + omega*(Y - Y{-1}) + RES_PIE;
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    % Unemployment.
    UNR_GAP = UNR_BAR - UNR;
    UNR_BAR = UNR_BAR{-1} + UNR_G
        - parhist/100*Y{-1} - lambda/100*(UNR_BAR{-1} - unr_ss) + RES_UNR_BAR;
    UNR_G = (1-alpha)*UNR_G{-1} + RES_UNR_G;
    UNR_GAP = phi1*UNR_GAP{-1} + phi2*Y + RES_UNR_GAP;

    % Capacity utilization.
    CAPU = CAPU_BAR + CAPU_GAP;
    CAPU_BAR = CAPU_BAR{-1} + CU_G + RES_CAPU_BAR;
    CU_G = (1 - delta)*CU_G{-1} + RES_CU_G;
    CAPU_GAP = kappa1*CAPU_GAP{-1} + kappa2*Y + RES_CAPU_GAP;

!variables:measurement

    GROWTH_
    PIE4_
    PIE4_PIELTE_
    D_CAPU_
    UNR_

!equations:measurement

    GROWTH_ = GROWTH;
    PIE4_ = PIE4;
    PIE4_PIELTE_ = PIE4 - PIELTE;
    D_CAPU_ = CAPU - CAPU{-1};
    UNR_ = UNR;
```
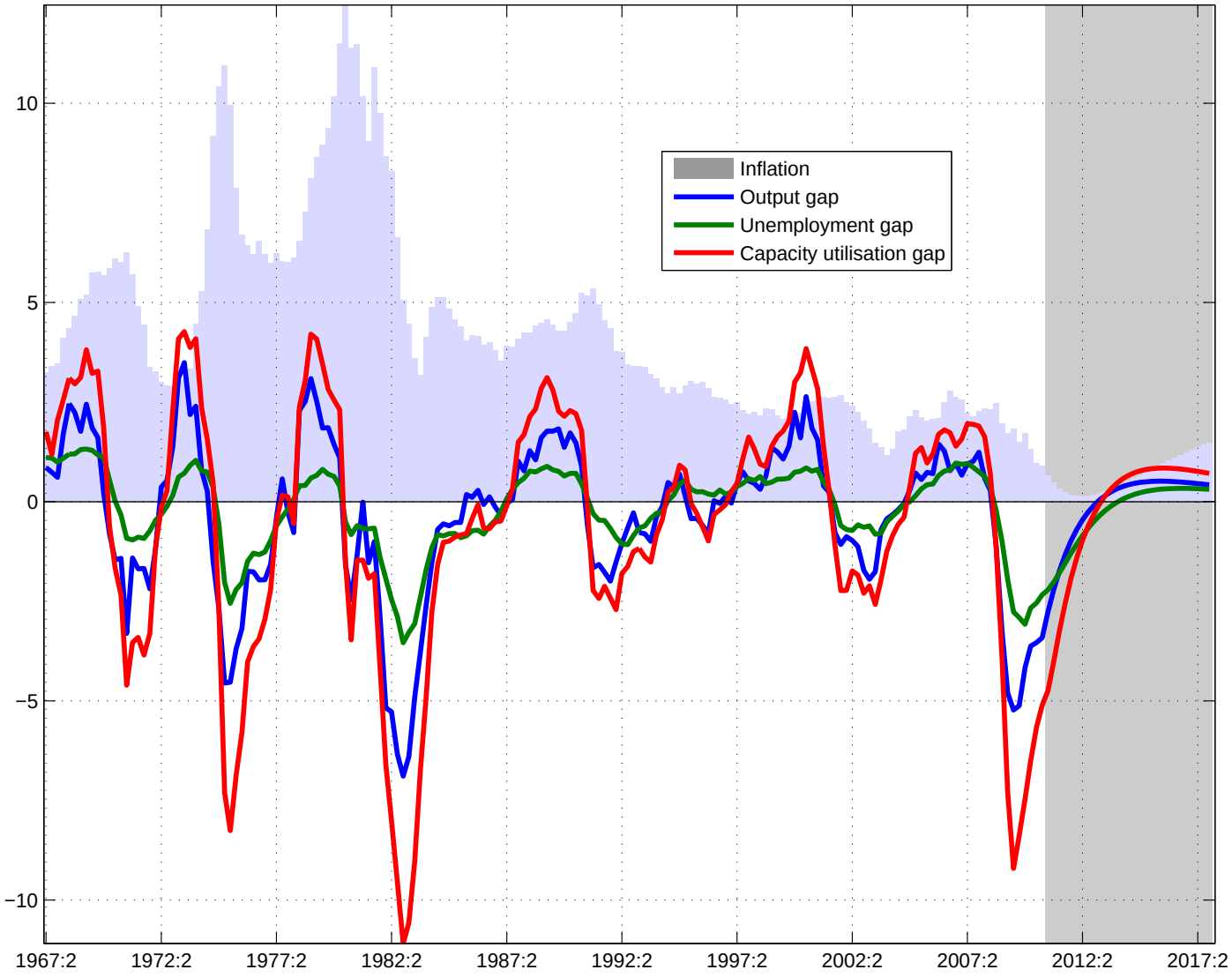
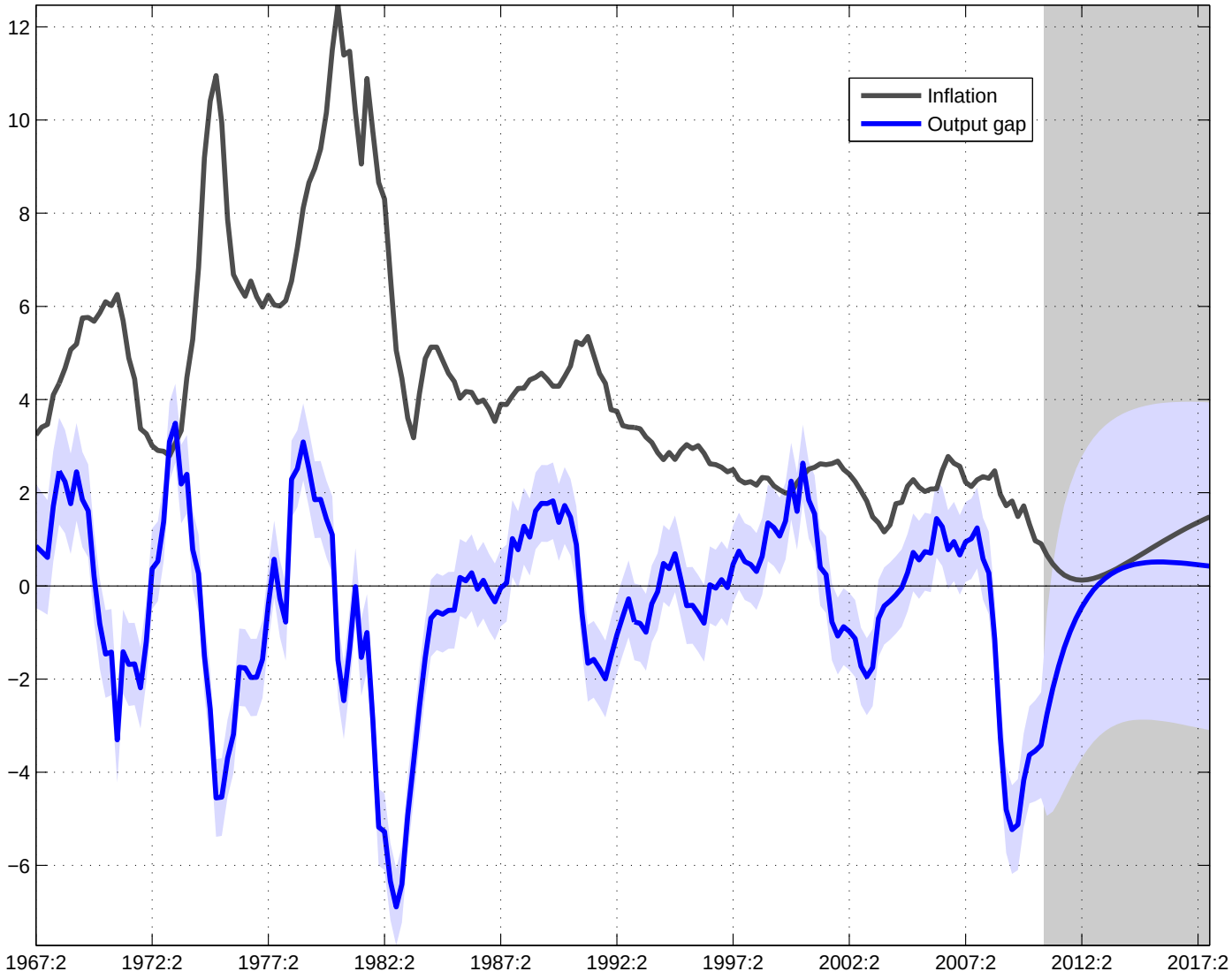
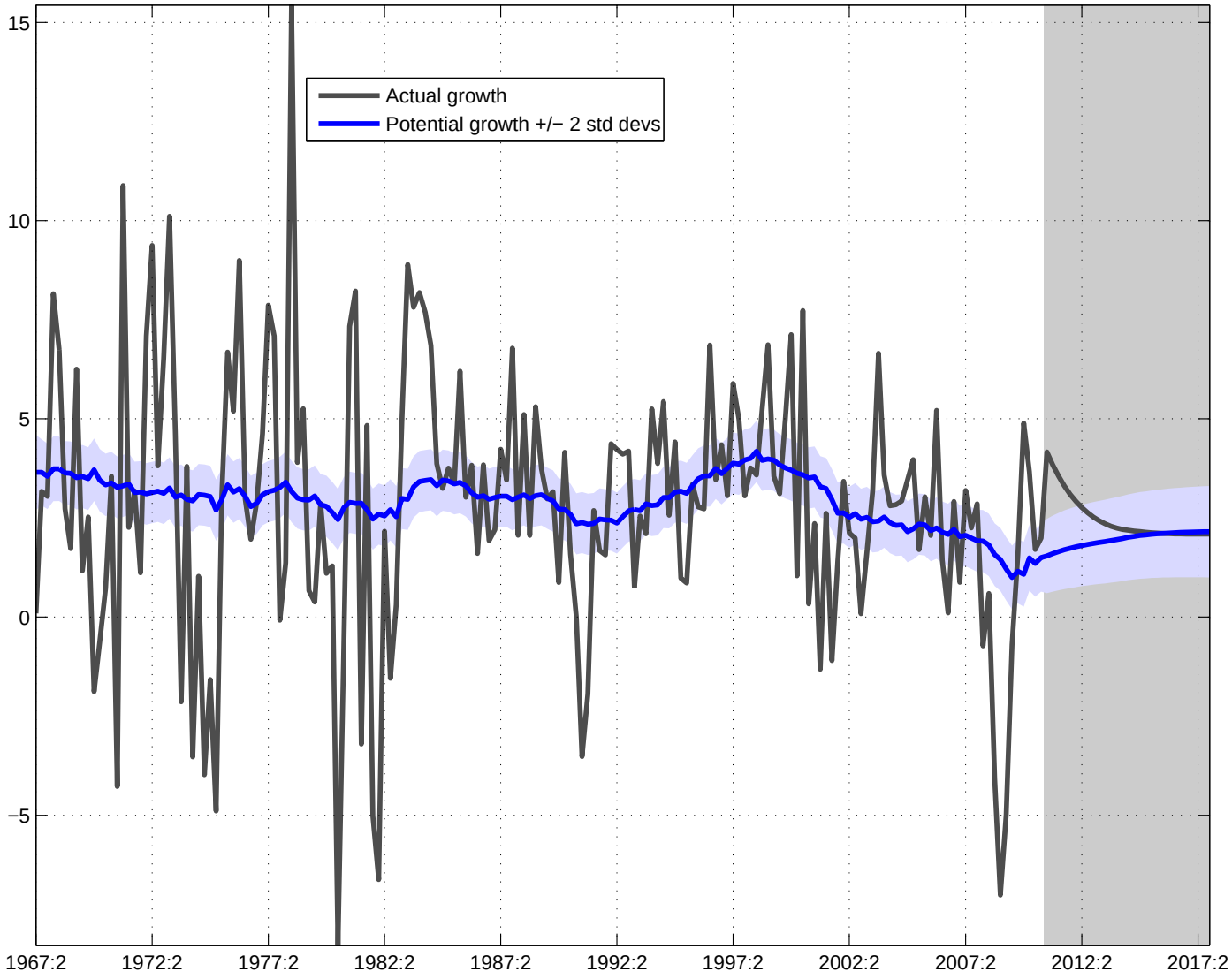

Economic activity gaps



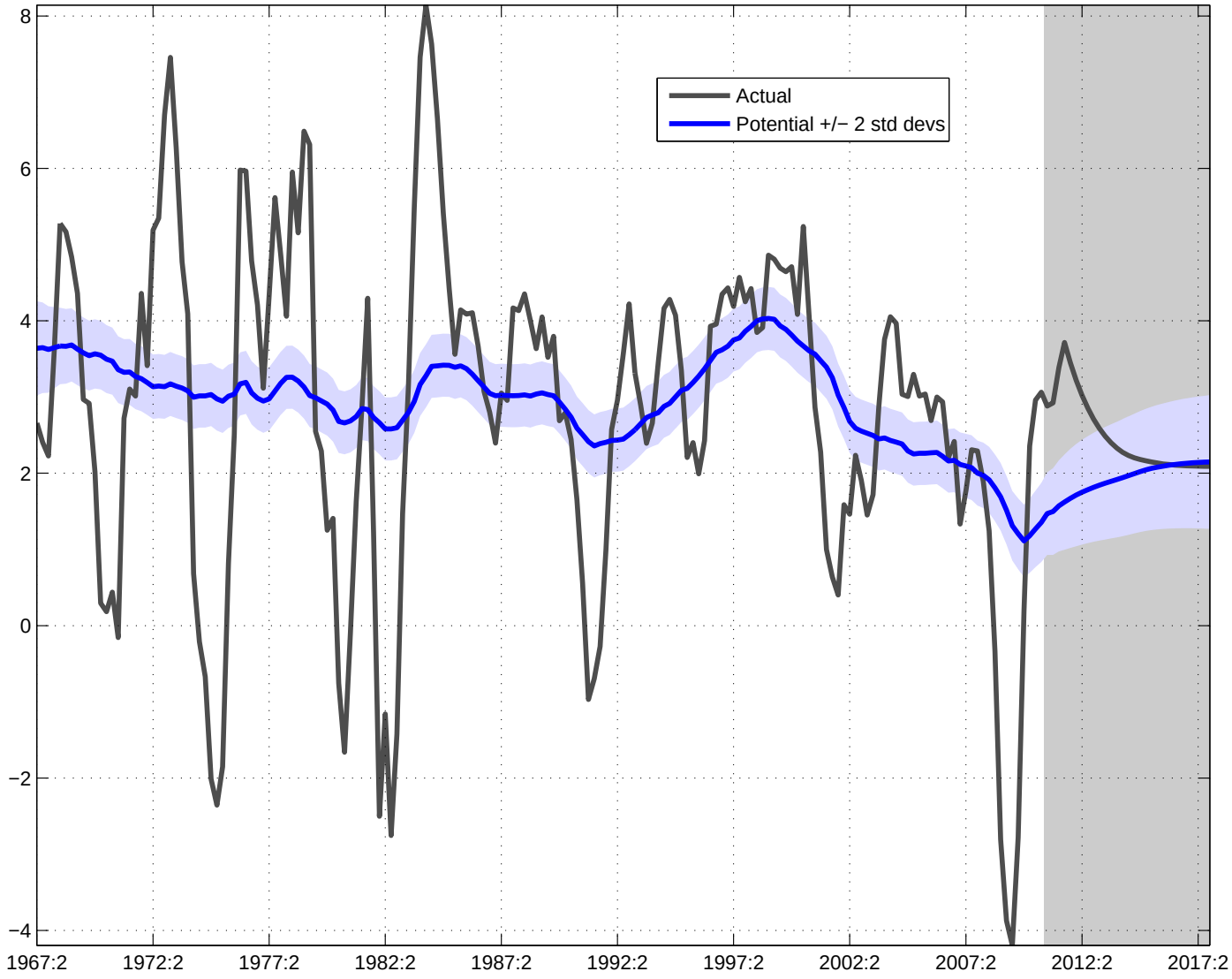
Output Gap +/- 2 std devs (w/o model or parameter uncertainty)



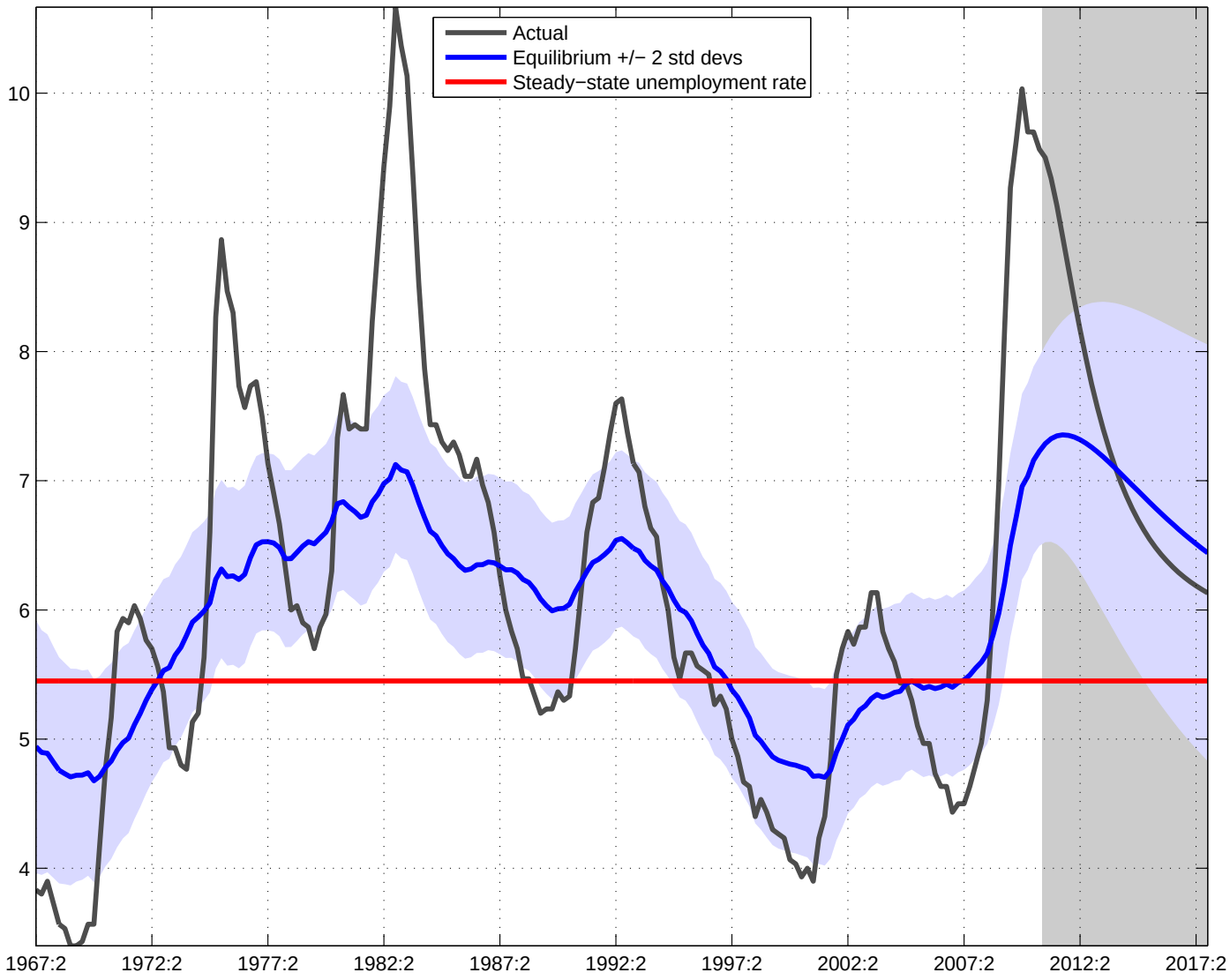
Output Growth (Q/Q Annualized) +/- 2 std devs (w/o model or parameter uncertainty)



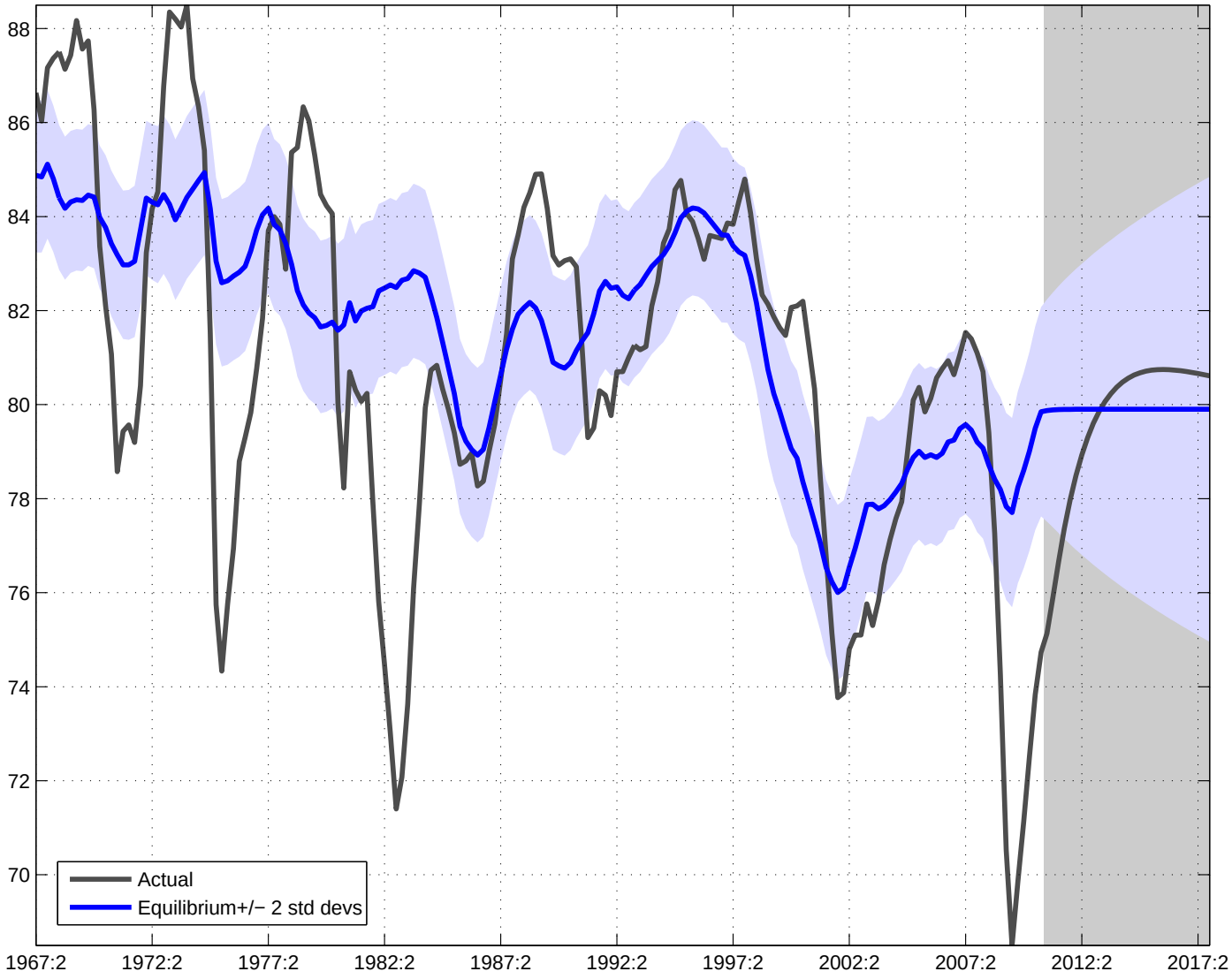
Output Growth (Y/Y) +/- 2 std devs (w/o model or parameter uncertainty)



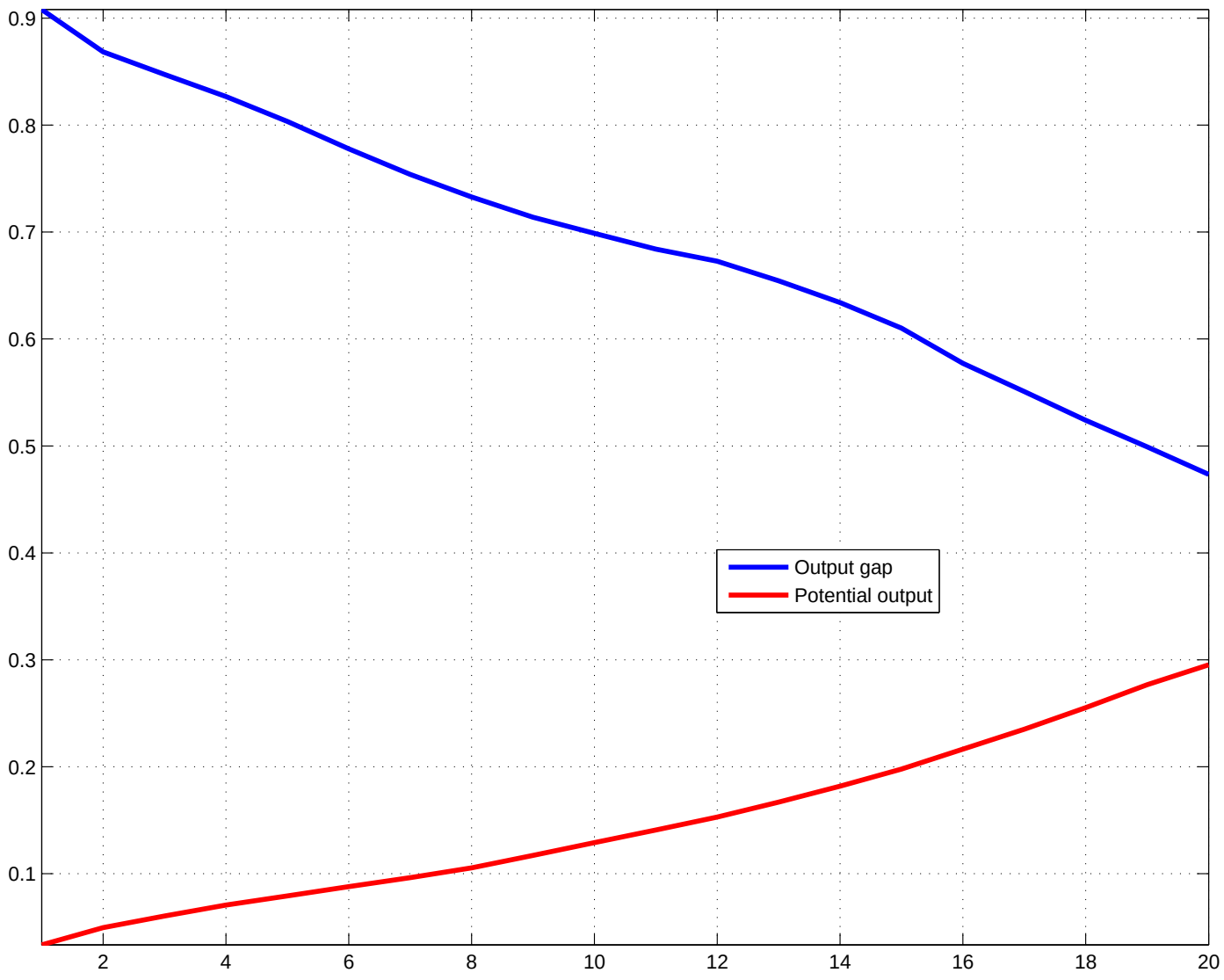
Unemployment Rate



Equilibrium Capacity Utilization +/- 2 std devs (w/o model or parameter uncertainty)



Relative Variances of Potential Growth and Changes in the Output Gap at Different Horizons



Regularized Maximum Likelihood

Parameter	Prior		Posterior	
	Mode	Dispersion	Mode	Dispersion
alpha	0.900	0.158	0.892	0.024
beta	0.400	0.316	0.144	0.022
omega	0.500	0.316	0.231	0.039
rho1	0.800	0.158	0.833	0.020
kappa1	0.100	0.632	0.331	0.038
phi1	0.800	0.158	0.717	0.021
phi2	0.300	0.158	0.195	0.013
tau	0.100	0.158	0.012	0.008
delta	0.500	0.158	0.493	0.024
kappa2	1.500	1.581	1.105	0.062
parhist	3.000	1.581	2.794	0.242
rho2	5.000	3.162	5.101	0.458
lambda	2.000	3.162	2.122	0.446
std_RES_Y	1.000	0.316	0.979	0.042
std_RES_G	0.050	0.032	0.072	0.004
std_RES_UNR_GAP	0.500	0.316	0.242	0.025
std_RES_UNR_BAR	0.100	0.158	0.098	0.020
std_RES_UNR_G	0.100	0.158	0.113	0.019
std_RES_CAPU_GAP	0.400	0.316	0.495	0.038
std_RES_CAPU_BAR	0.250	0.158	0.370	0.023
std_RES_CU_G	0.075	0.032	0.089	0.005
std_RES_PIE	0.500	0.316	0.565	0.031
std_RES_PIELTE	0.300	0.316	0.074	0.006
std_RES_LGDP_BAR	0.013	0.008	0.014	0.001

Calibrated Parameters

Parameter	Value
`lab_share`	0.700
`growth_ss`	2.500
`unr_ss`	5.450

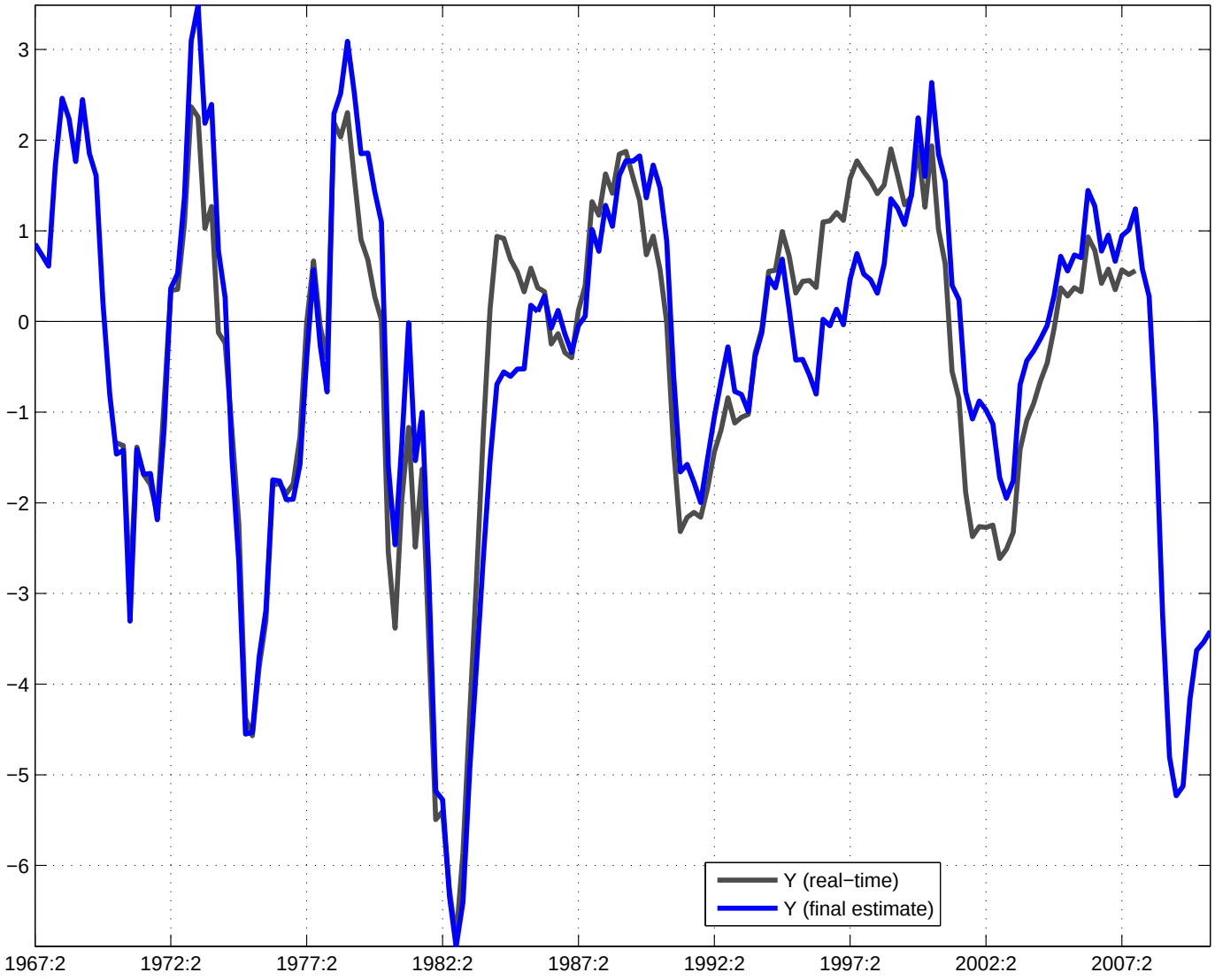
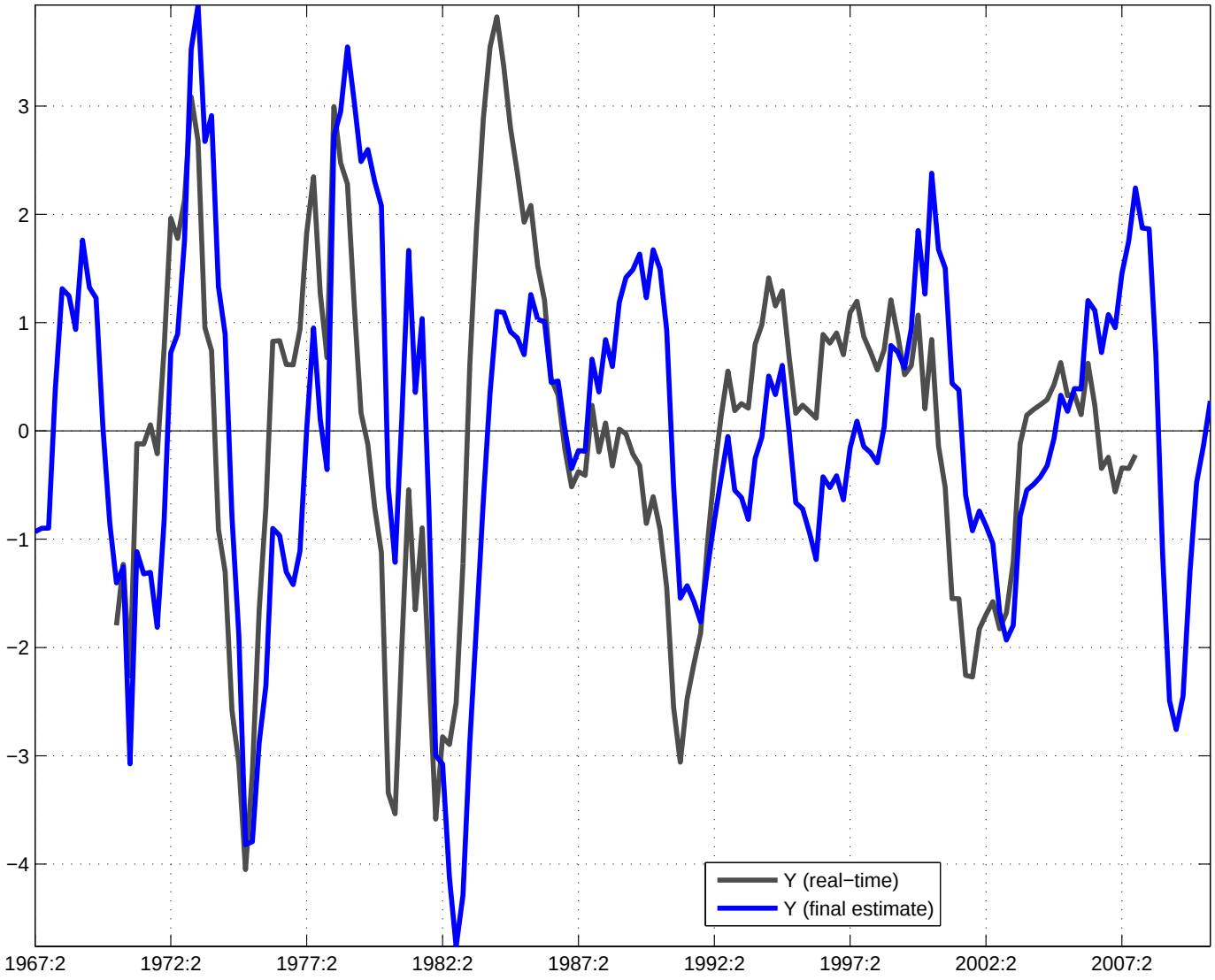
RMSEs

Parameter	1Q Ahead	4Q Ahead	8Q Ahead	12Q Ahead
GROWTH_	3.537	3.337	3.347	3.409
PIE4_	0.508	1.381	1.973	2.362
UNR_	0.296	0.976	1.500	1.621

Mean absolute revisions (according to most recent estimates)

quarter	$t-12$	$t-8$	$t-4$	t (nowcast)
`Y`	0.139	0.211	0.371	0.568
`Y (HP)`	0.172	0.333	0.754	1.250
`UNR_GAP`	0.078	0.094	0.116	0.151
`UNR_GAP (HP)`	0.087	0.176	0.393	0.640

Real-time output gap (MV)



Real-time output gap (HP)