ModYUK Report: USVER2

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_

    % These measurement variables are used to impose priors on unobservables.
    GROWTH_BAR_

!equations:measurement

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

    % These measurement equations are used to impose priors on unobservbles.
    GROWTH_BAR_ = GROWTH_BAR;
```
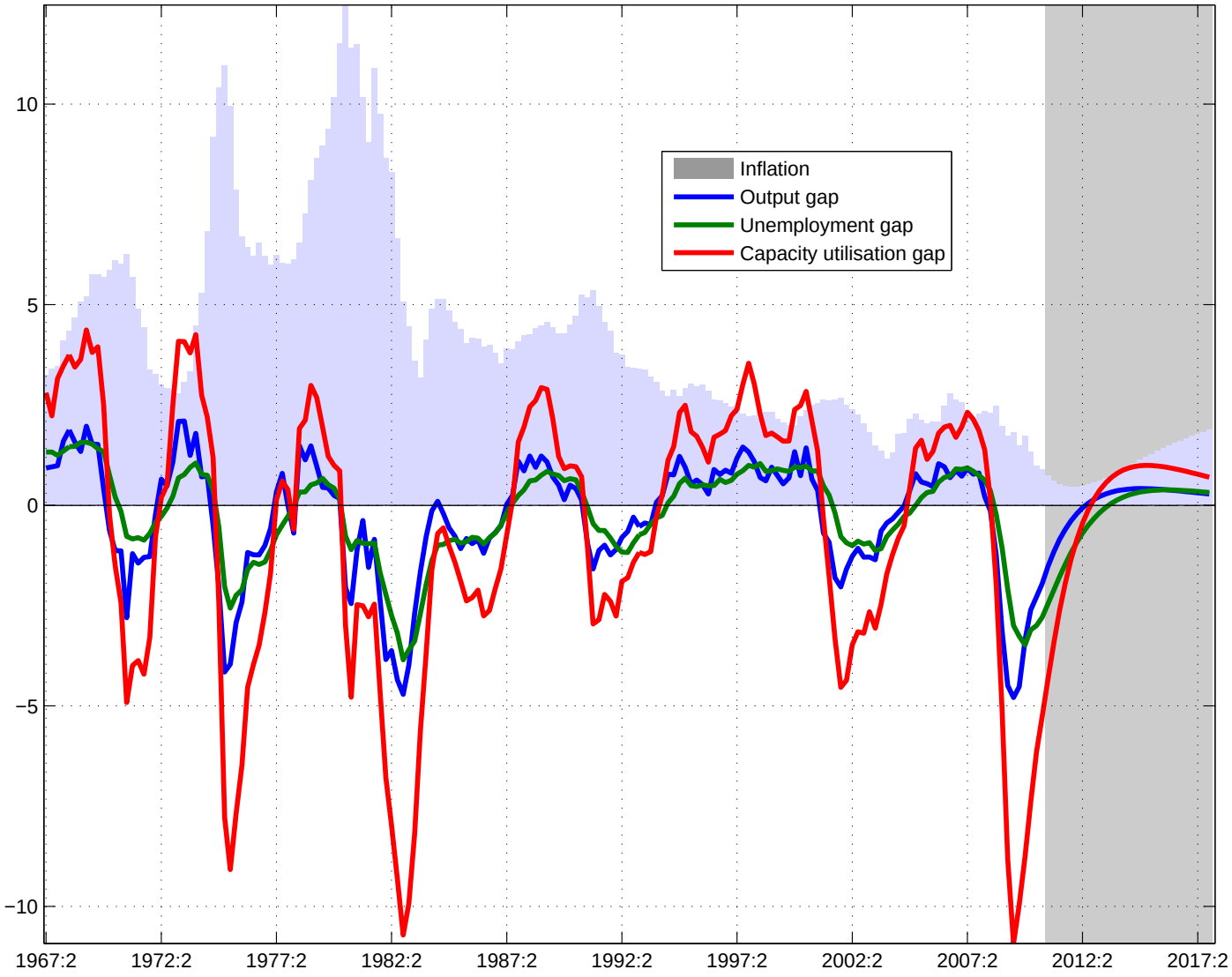
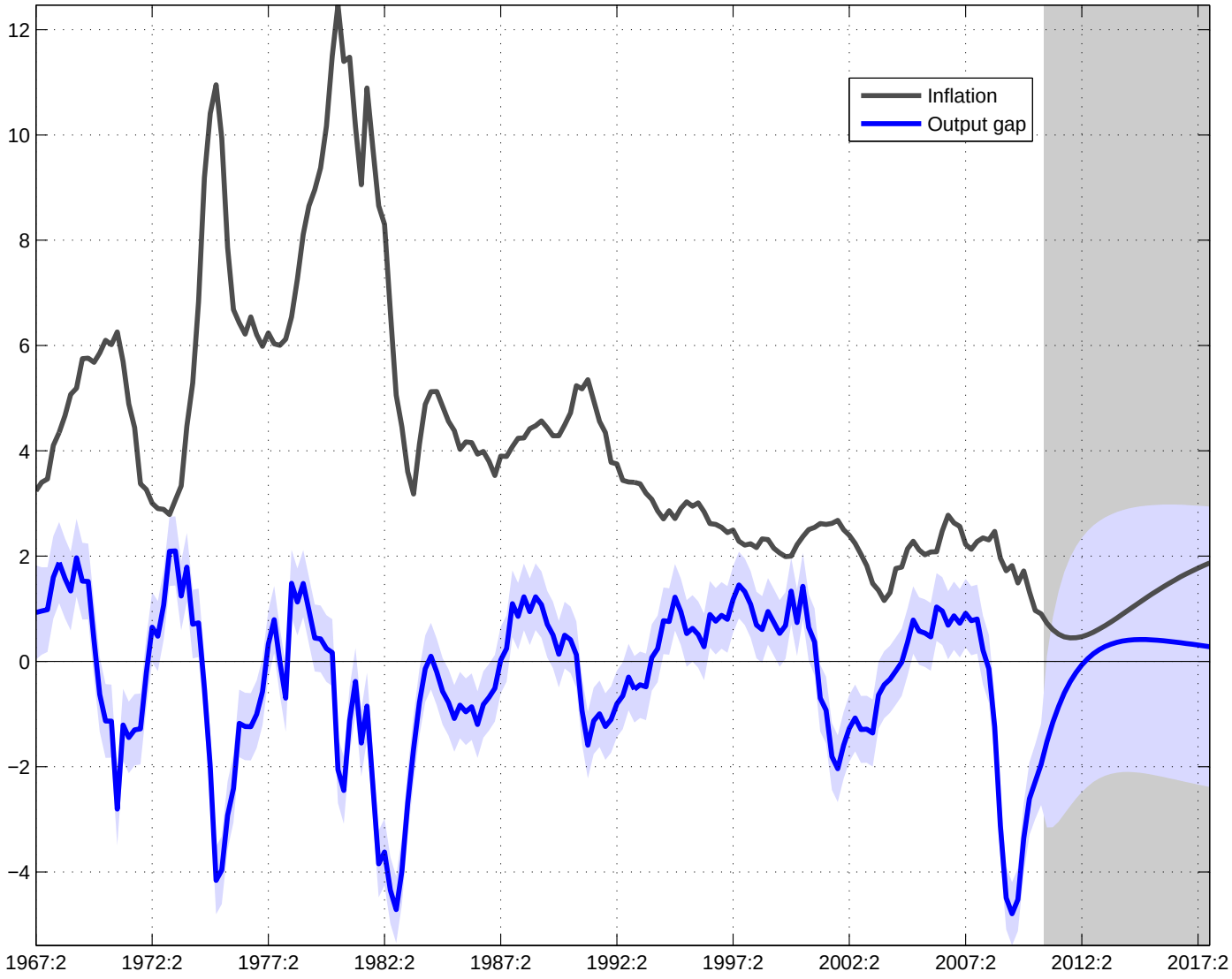
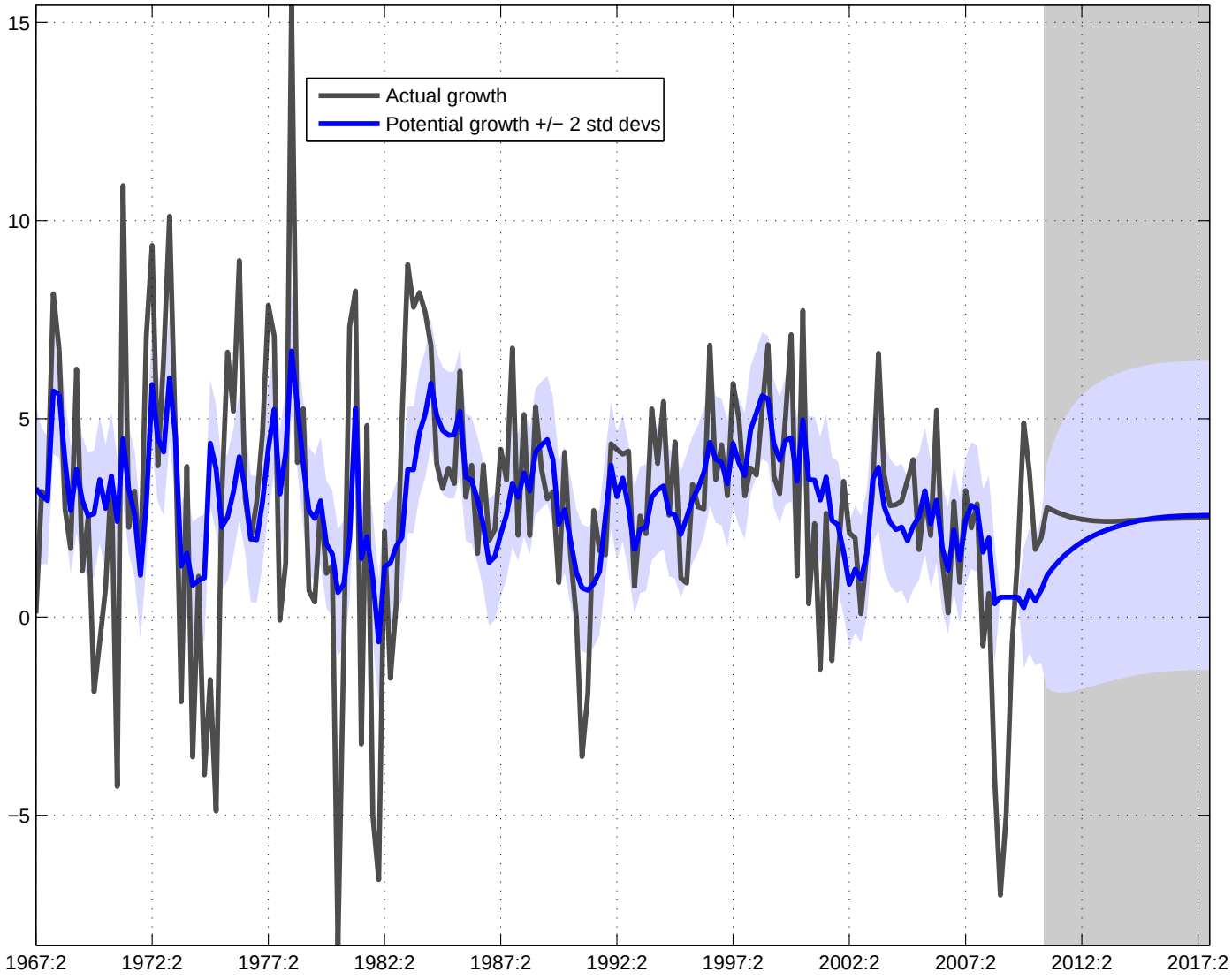

Economic activity gaps



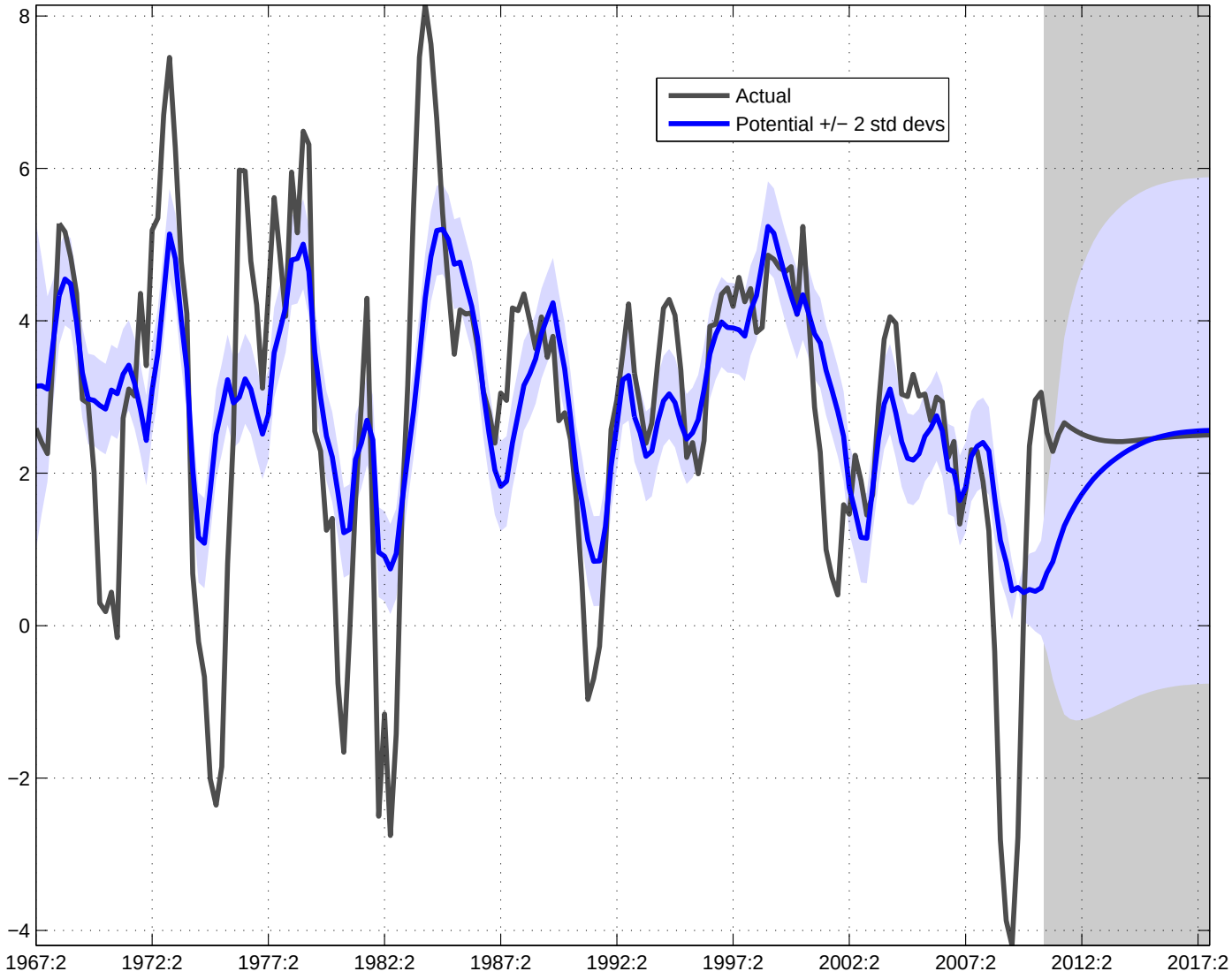
Output Gap +/- 2 std devs (w/o model or parameter uncertainty)



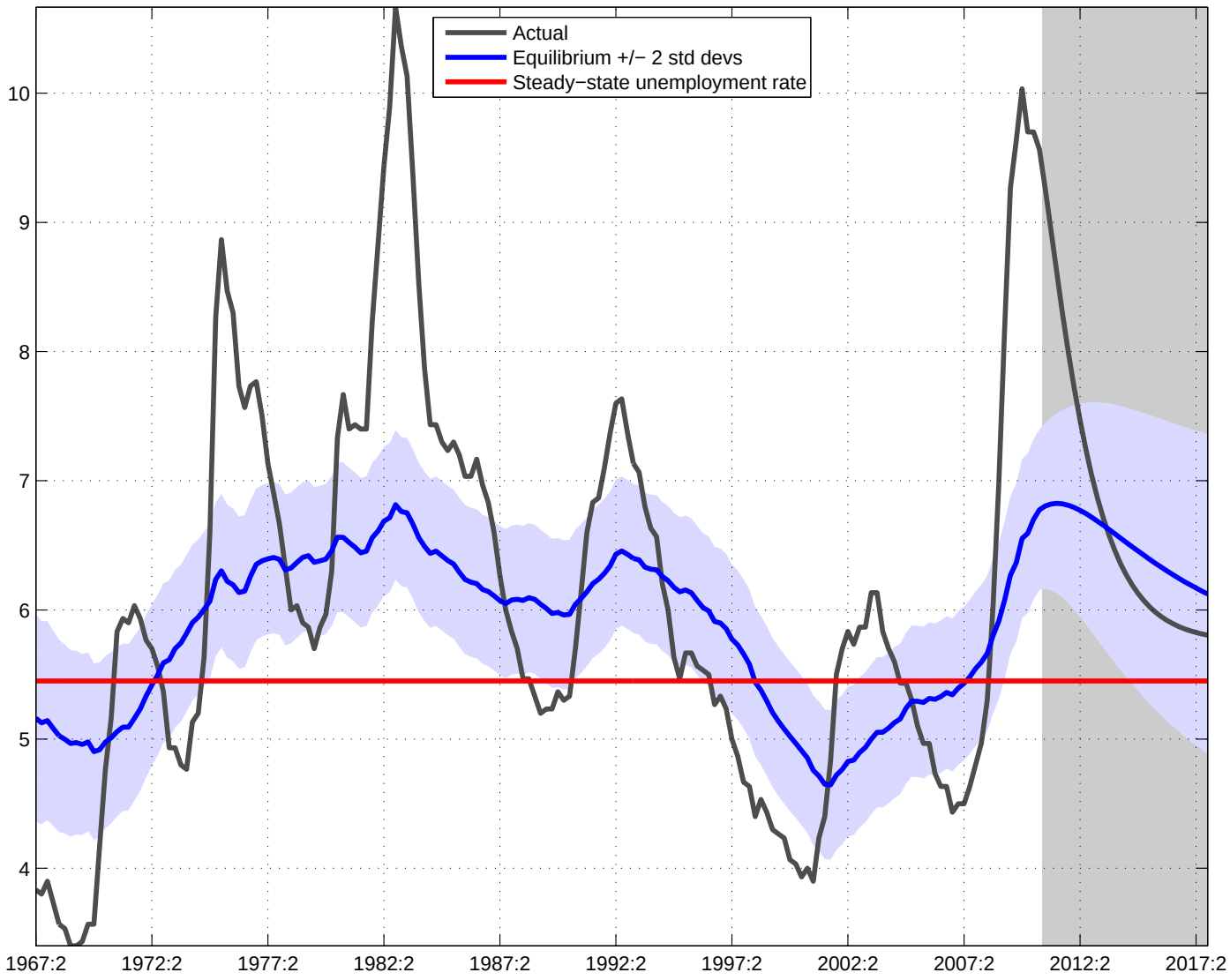
Output Growth (Q/Q Annualized) +/- 2 std devs (w/o model or parameter uncertainty)



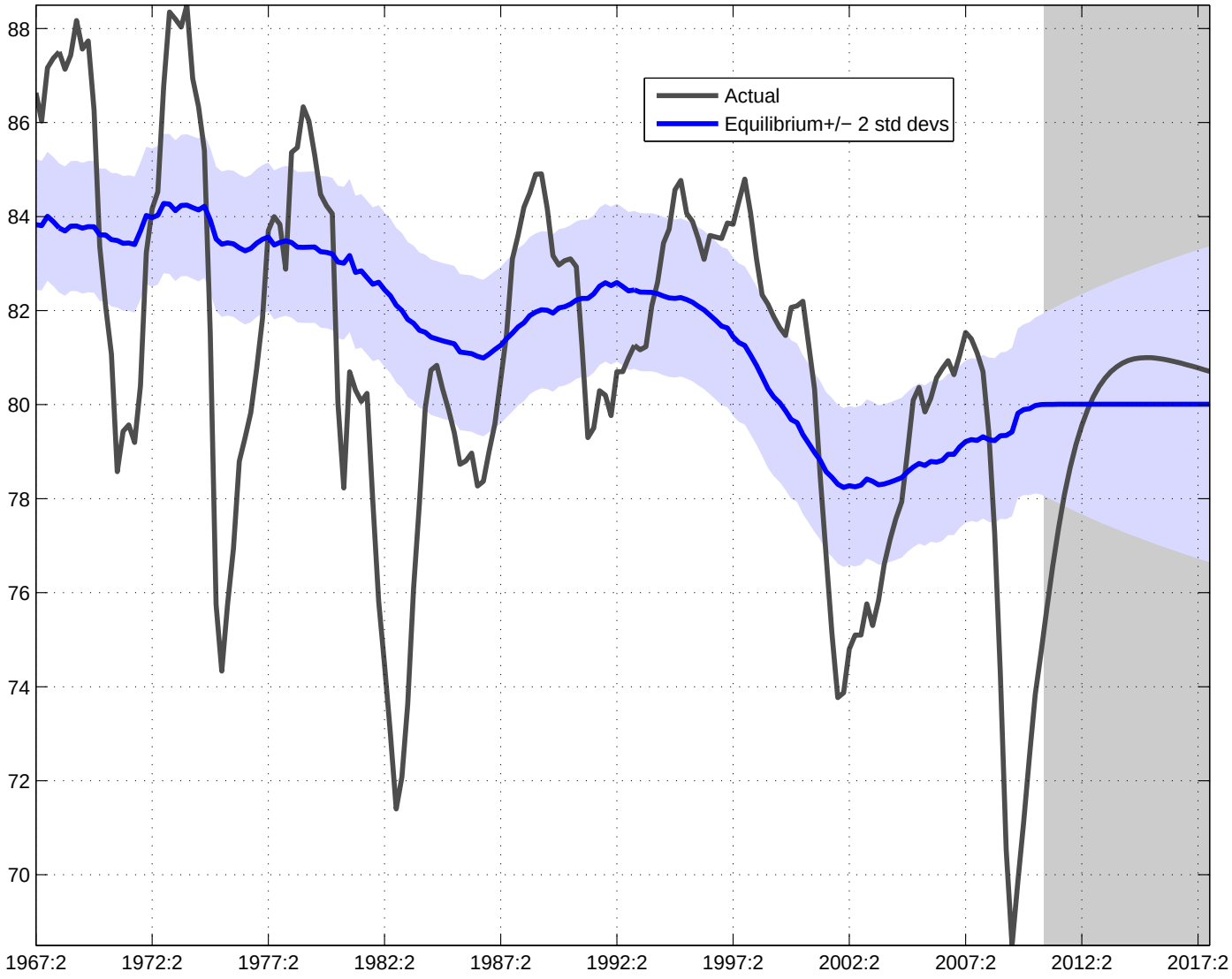
Output Growth (Y/Y) +/- 2 std devs (w/o model or parameter uncertainty)



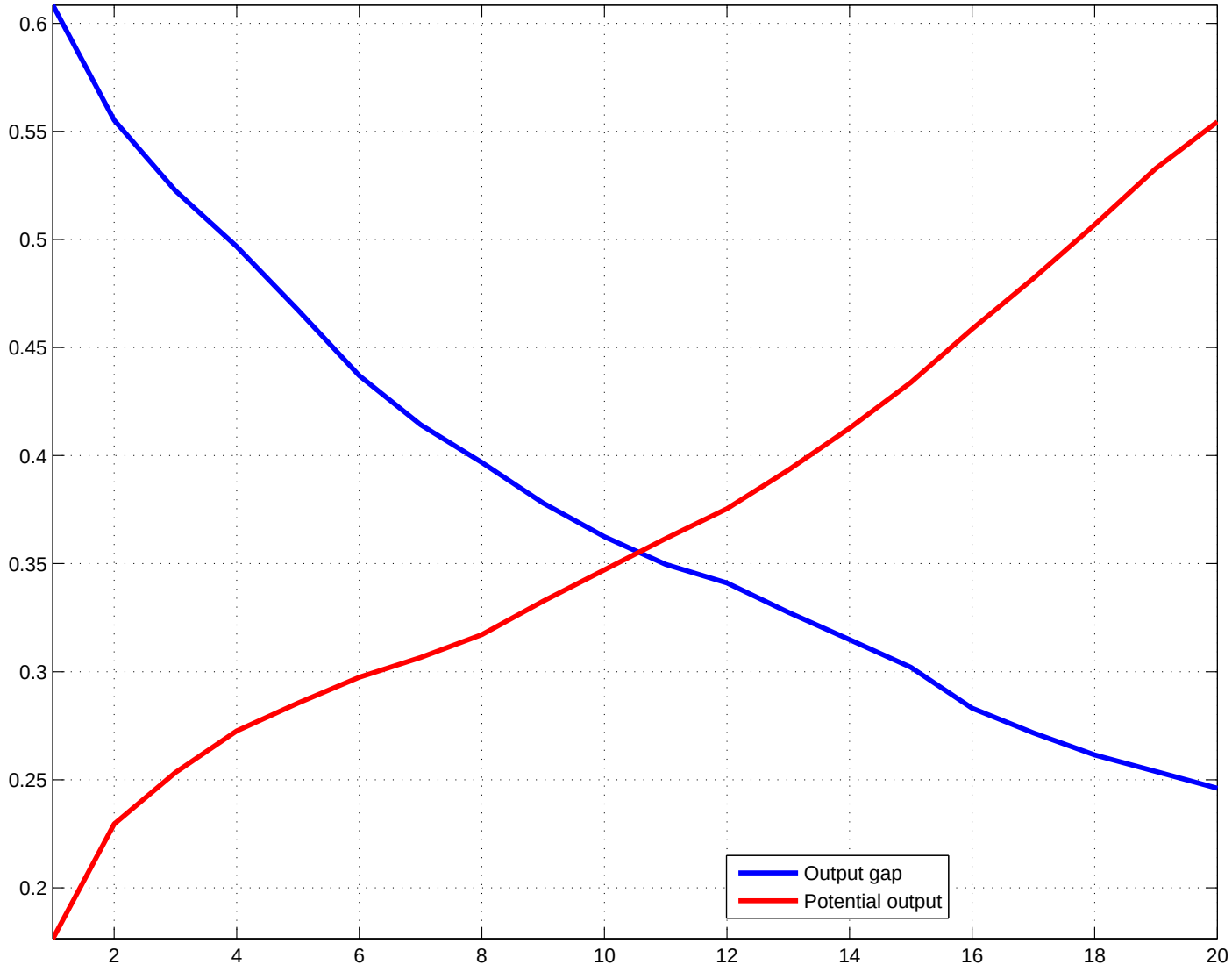
Unemployment Rate



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	0.893	0.024
beta	0.400	0.316	0.181	0.025
omega	0.500	0.316	0.231	0.041
rho1	0.800	0.158	0.823	0.020
kappa1	0.100	0.632	0.415	0.035
phi1	0.800	0.158	0.734	0.019
phi2	0.300	0.158	0.267	0.016
tau	0.100	0.158	0.122	0.021
delta	0.500	0.158	0.497	0.024
kappa2	1.500	1.581	1.407	0.074
parhist	3.000	1.581	2.829	0.237
rho2	5.000	3.162	5.087	0.462
lambda	2.000	3.162	2.056	0.442
std_RES_Y	1.000	0.316	0.750	0.043
std_RES_G	1.000	0.316	0.824	0.046
std_RES_UNR_GAP	0.500	0.316	0.179	0.026
std_RES_UNR_BAR	0.100	0.158	0.076	0.021
std_RES_UNR_G	0.100	0.158	0.086	0.020
std_RES_CAPU_GAP	0.400	0.316	0.387	0.038
std_RES_CAPU_BAR	0.250	0.158	0.225	0.023
std_RES_CU_G	0.075	0.032	0.062	0.005
std_RES_PIE	0.500	0.316	0.508	0.033
std_RES_PIELTE	0.300	0.316	0.075	0.009
std_RES_LGDP_BAR	0.250	0.079	0.212	0.012

Calibrated Parameters

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

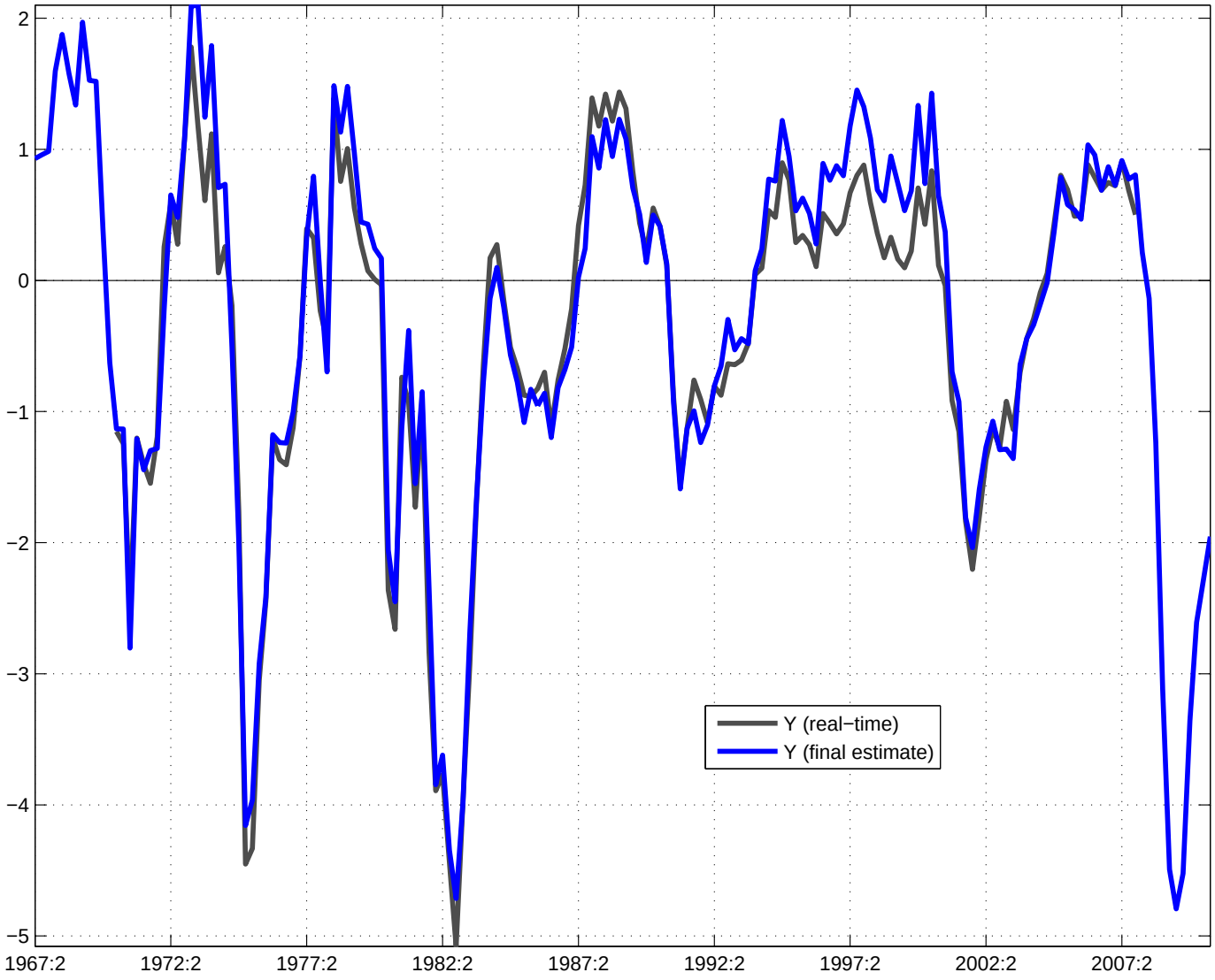
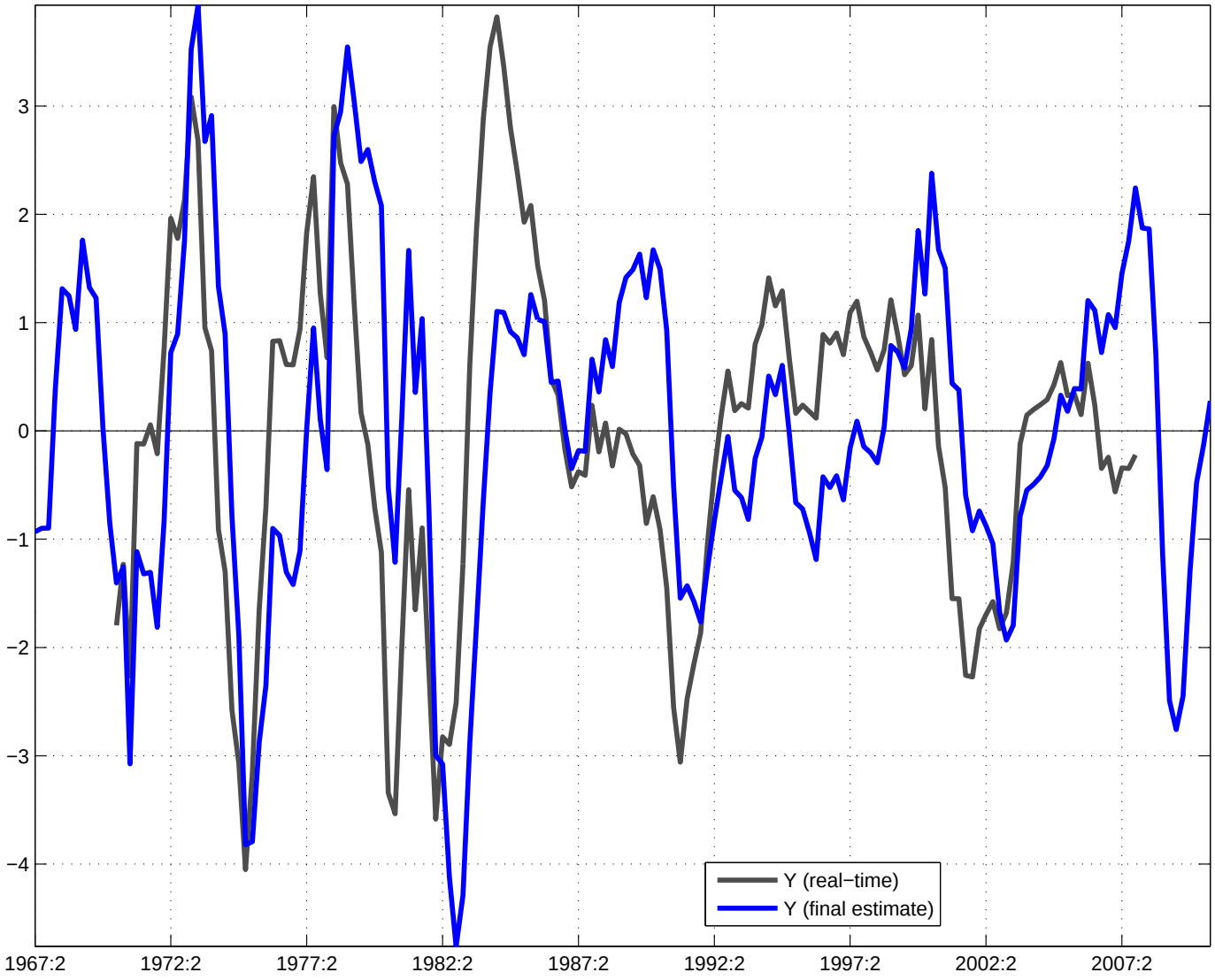
RMSEs

Parameter	1Q Ahead	4Q Ahead	8Q Ahead	12Q Ahead
GROWTH_	3.366	3.380	3.382	3.422
PIE4_	0.506	1.383	1.978	2.348
UNR_	0.285	0.955	1.450	1.577

Mean absolute revisions (according to most recent estimates)

quarter	$t-12$	$t-8$	$t-4$	t (nowcast)
`Y`	0.108	0.132	0.168	0.224
`Y (HP)`	0.172	0.333	0.754	1.250
`UNR_GAP`	0.100	0.115	0.133	0.149
`UNR_GAP (HP)`	0.087	0.176	0.393	0.640

Real-time output gap (MV)



Real-time output gap (HP)