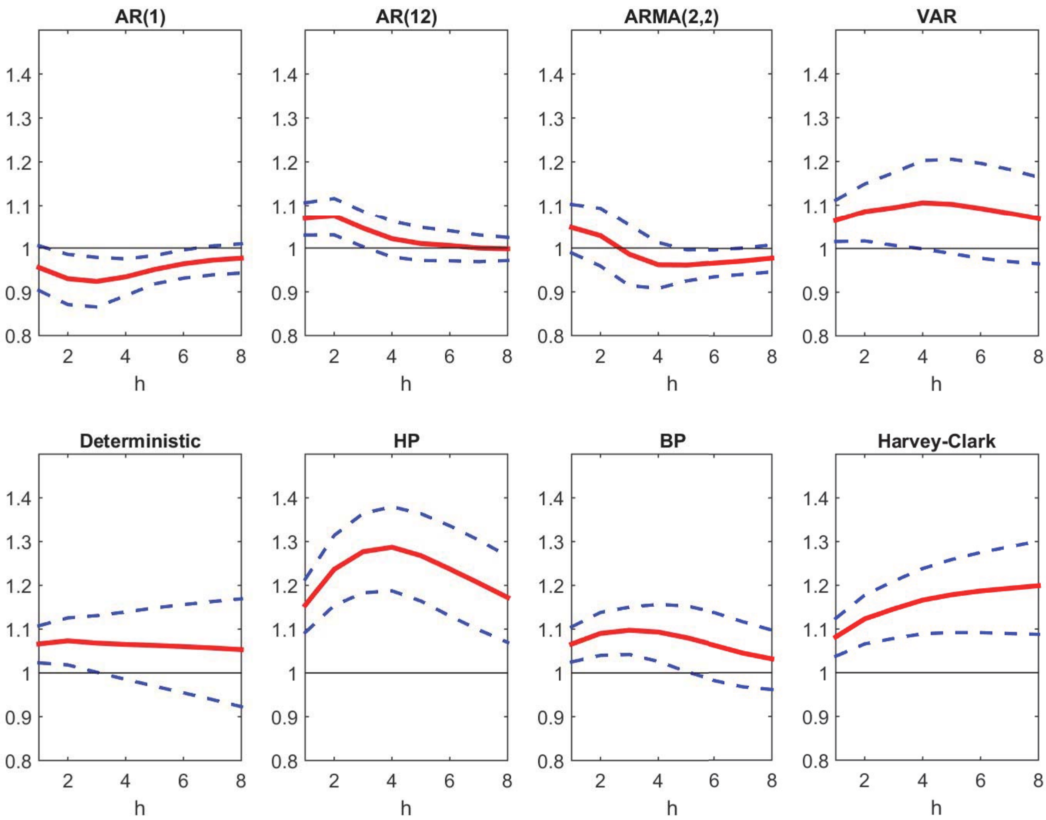
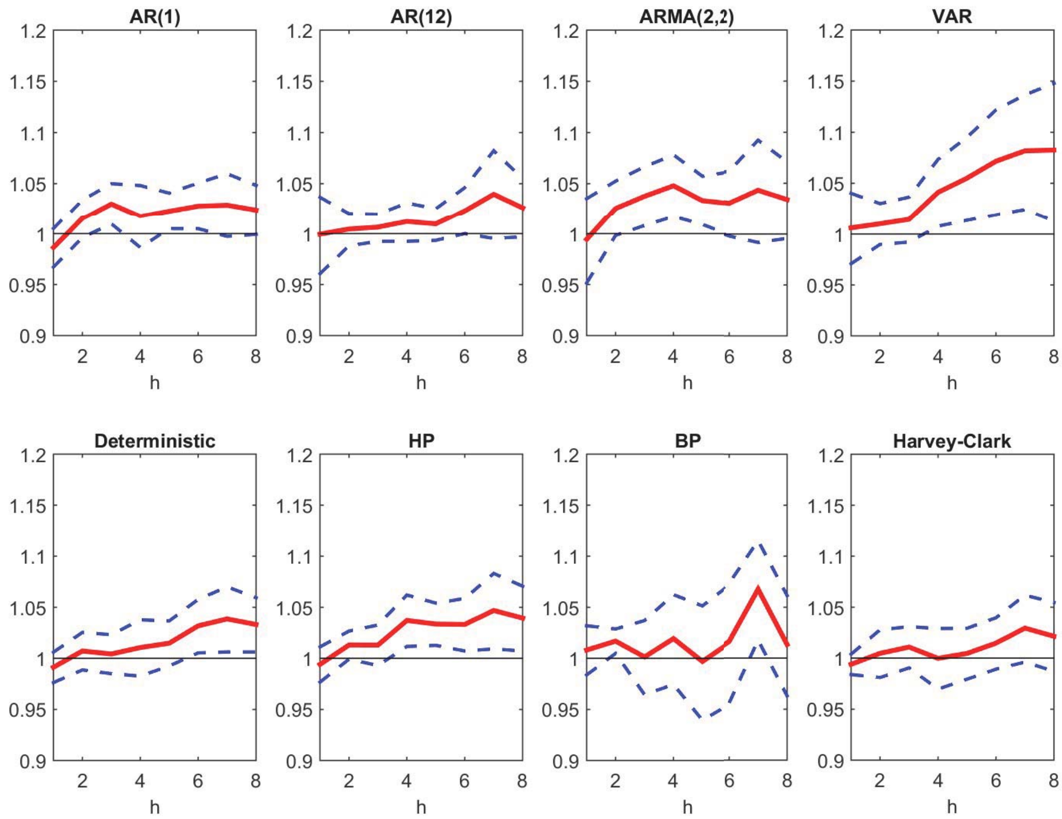
Figure A9: Out-of-sample U.S. output growth forecast comparison relative to the BN filter benchmark using real-time output gap estimates



Notes: See notes for Figure A1 for descriptions of labels of methods. The graphs plot out-of-sample RRMSE compared to forecasts based on the BN filter estimated output gap. Out-of-sample evaluation begins in 1970Q1. The bands depict 90% confidence intervals from a two-sided Diebold and Mariano (1995) test of equal forecast accuracy.

Figure A10: Out-of-sample U.S. inflation forecast comparison relative to the BN filter benchmark using real-time output gap estimates



Notes: See notes for Figure A1 for descriptions of labels of methods. The graphs plot out-of-sample RRMSE compared to forecasts based on the BN filter estimated output gap. Out-of-sample evaluation begins in 1970Q1. The bands depict 90% confidence intervals from a two-sided Diebold and Mariano (1995) test of equal forecast accuracy.

A6 More Results When Applying Dynamic Mean Adjustment

Possible Structural Break in 2006Q1 In the main text, we suggested that dynamically demeaning output growth using a backward-looking rolling 40-quarter average does a reasonable job at accounting for possible structural breaks in the data. Here we explore whether the BN filter with dynamic mean adjustment is still reliable.

First, we recalculate revision statistics, taking the dated break from the Bai and Perron (2003) test in 2006Q1 as the "truth" when estimating the ex post output gap. As we argue in the main text, one should be careful about treating the break in 2006Q1 as the truth given there is evidence that the dated break may not be robust and future data may change the dating of a break (if any). With this caveat in mind, Figure A11 presents the revision statistics treating the 2006Q1 break date as the truth. Not surprisingly, the BN filter modified to use dynamic mean adjustment now has somewhat larger revisions given that dynamic mean adjustment leads to more noise in the estimated output gap in pseudo real time relative to knowing the truth about the structural break. In particular, the BN filter with dynamic mean adjustment produces larger revisions given the dynamic mean adjustment relative to the estimated output gaps from BN decompositions based on AR(1) and ARMA(2,2) models. Recall, however, that these two models lead to estimated output gaps with small amplitude and, the case of the AR(1) model, an estimated output gap that moves countercyclically in terms of the NBER reference cycle. Relative to all the other methods that produce procyclical estimates, the BN filter with dynamic mean adjustment is still comparatively reliable in terms of its revision properties.

Second, we redo the pseudo-out-of-sample forecasting analysis for both output growth and inflation with the BN filter with dynamic mean adjustment serving as the benchmark. As Figures A12 and A13 show, the forecasting results are little changed relative to those in the main text, suggesting once again that despite the somewhat larger revisions, the BN filter with dynamic mean adjustment remains reliable in the sense of avoiding producing a spurious cycle.

Dynamic Mean Adjustment for Other Countries In the main text, we show that dynamic mean adjustment does a reasonable job accounting for a possible break in 2006Q1 with U.S. data. We now also explore whether dynamic mean adjustment does a reasonable job for other countries as well. We thus apply the procedure for the non-U.S. G7 countries, Australia, and New Zealand. We first report in Table A1 the break dates as estimated for the Bai and Perron (2003) test. These are also the break dates which we use for the non-U.S. G7 countries, Australia, and New Zealand output gap estimates in the main text. Figure A14 presents the BN filter estimated output gaps for the non-U.S. G7 countries, Australia, and New Zealand using dynamic mean adjustment and for the

Table A1: Break dates according to Bai and Perron (2003) Test

Australia	1971Q4
Canada	1974Q1
France	1974Q1
Germany	None
Italy	1973Q1, 1991Q2
Japan	1979Q4, 2008Q1
New Zealand	None
United Kingdom	None

break date(s) estimated by Bai and Perron (2003) procedures. A visual inspection suggest that dynamic mean adjustment is once again reasonably successful in accounting for the estimated breaks in long-run growth.

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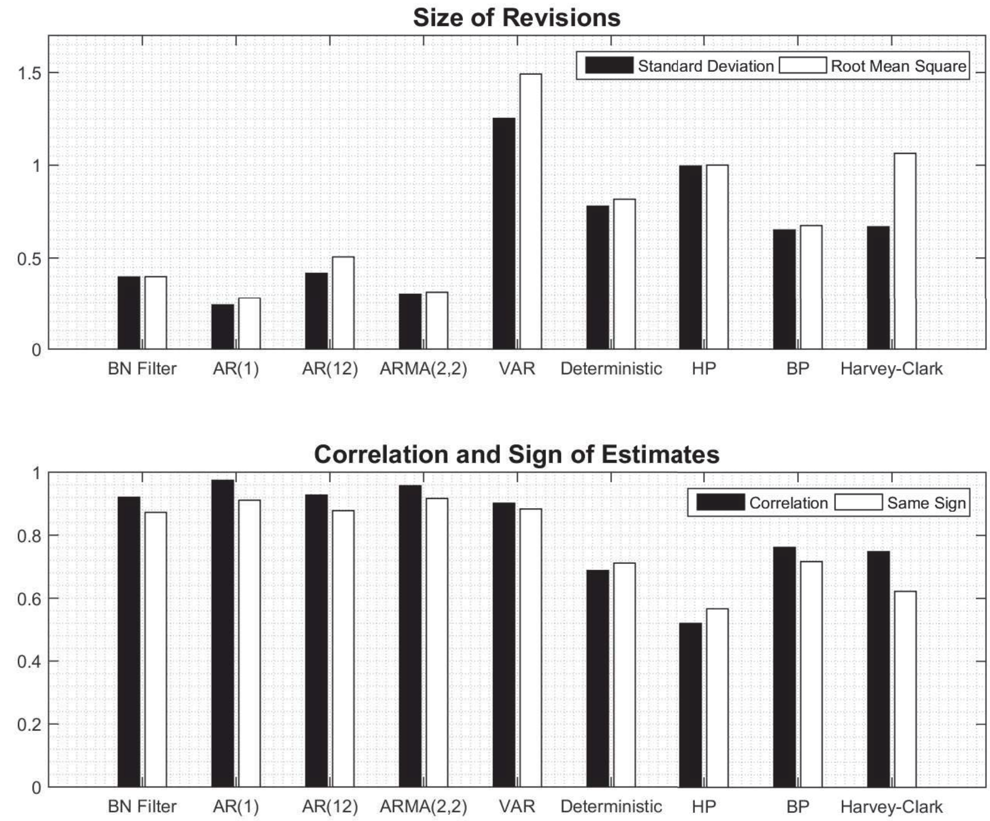
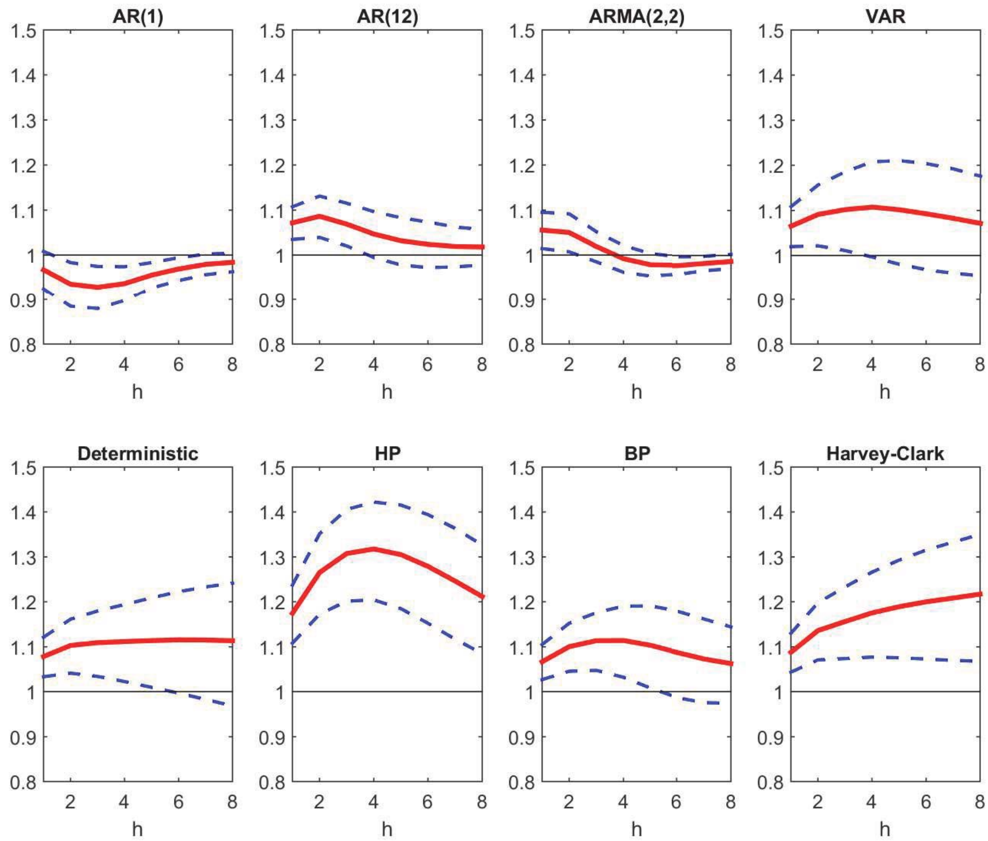
Figure A11: Revision statistics for U.S. output gap estimates with the BN filter modified to use dynamic mean adjustment



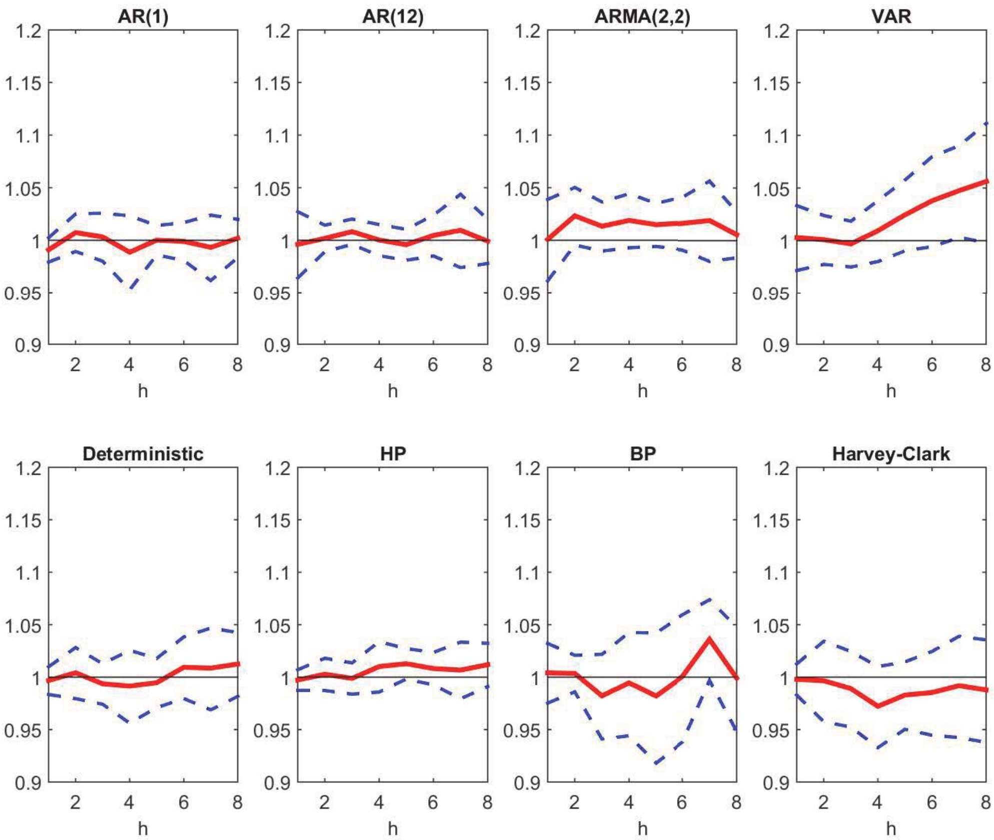
Notes: See notes for Figure A1 for descriptions of labels of methods. Standard deviation and root mean square of revisions to the pseudo-real-time estimate of the output gap are normalized by the standard deviation of the ex post estimate of the output gap. "Correlation" refers to the correlation between the pseudo-real-time estimate and the ex post estimate of the output gap. "Same sign" refers to the proportion of real-time estimates that share the same sign as the ex post estimate of the output gap. The sample period for calculation of revision statistics is 1970Q1 - 2012Q4.

Figure A12: Out-of-sample U.S. output growth forecast comparison relative to the BN filter with dynamic mean adjustment using pseudo-real-time output gap estimates



Notes: See notes for Figure A1 for descriptions of labels of methods. The graphs plot out-of-sample RRMSE compared to forecasts based on the BN filter with dynamic mean adjustment. Out-of-sample evaluation begins in 1970Q1. The bands depict 90% confidence intervals from a two-sided Diebold and Mariano (1995) test of equal forecast accuracy.

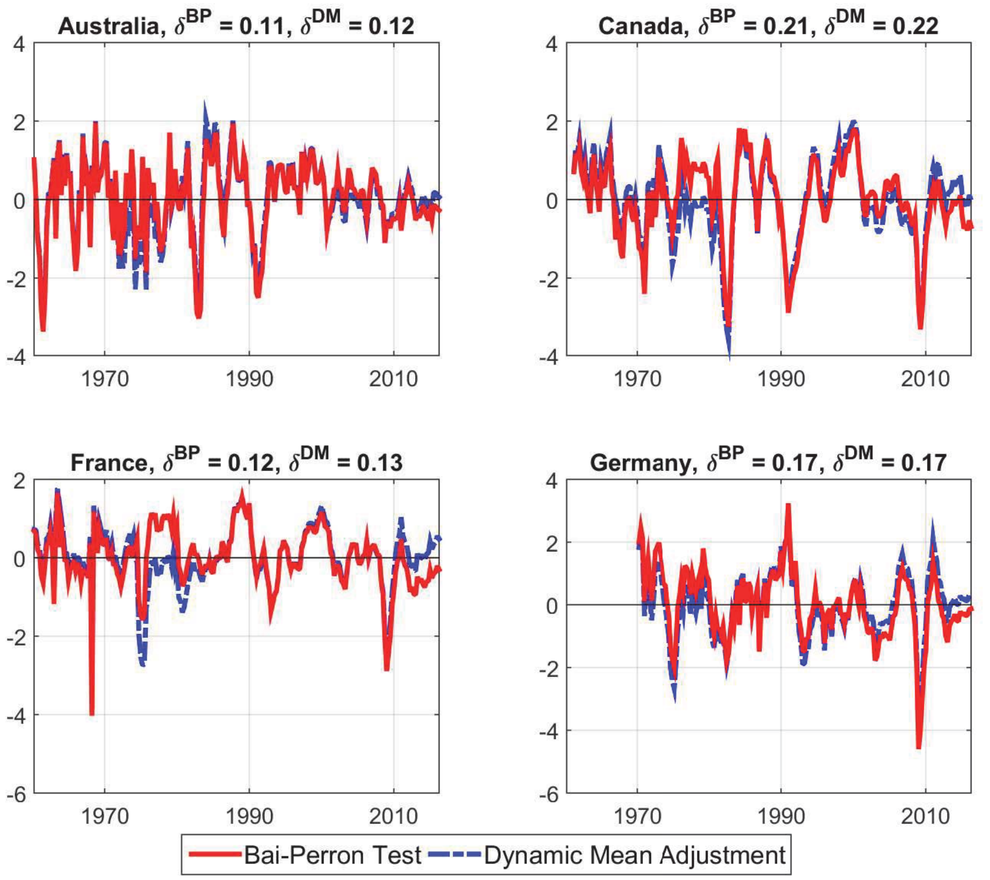
Figure A13: Out-of-sample U.S. inflation forecast comparison relative to the BN filter with dynamic mean adjustment using pseudo-real-time output gap estimates



Notes: See notes for Figure A1 for descriptions of labels of methods. The graphs plot out-of-sample RRMSE compared to forecasts based on the BN filter with dynamic mean adjustment. Out-of-sample evaluation begins in 1970Q1. The bands depict 90% confidence intervals from a two-sided Diebold and Mariano (1995) test of equal forecast accuracy.

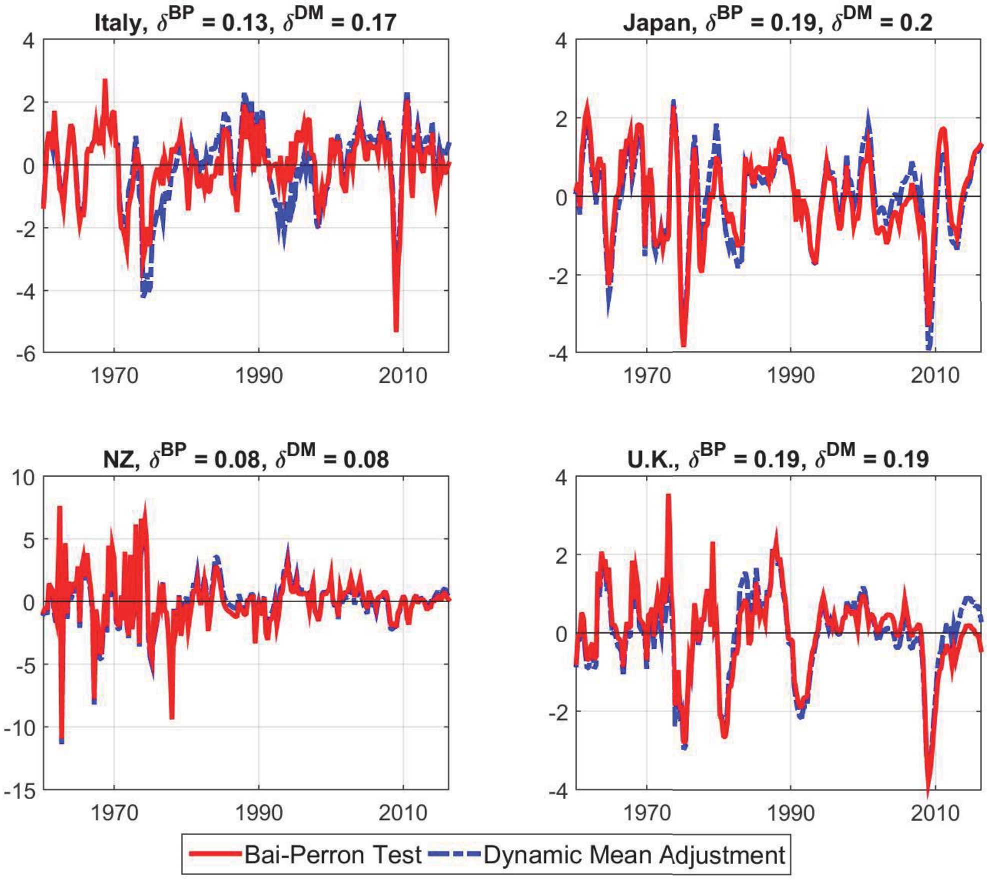
Figure A14: Output gap estimates from the BN filter allowing for structural change for the non-U.S. G7 countries, Australia, and New Zealand

(a)



Notes: Units are 100 times natural log deviation from trend. The solid line is the estimated output gap from the BN filter with break dates determined by the Bai and Perron (2003) test. δ^{BP} *is the corresponding signal-to-noise ratio that maximizes the amplitude-to-noise ratio. The dashed line is the output gap from the BN filter with dynamic mean adjustment.* δ^{DM} *is the corresponding signal-to-noise ratio that maximizes the amplitude-to-noise ratio.*

(b)



Notes: Units are 100 times natural log deviation from trend. The solid line is the estimated output gap from the BN filter with break dates determined by the Bai and Perron (2003) test. δ^{BP} is the corresponding signal-to-noise ratio that maximizes the amplitude-to-noise ratio. The dashed line is the output gap from the BN filter with dynamic mean adjustment. δ^{DM} is the corresponding signal-to-noise ratio that maximizes the amplitude-to-noise ratio.