

Do expectations matter? The Great Moderation revisited

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This appendix reports tables with additional material discussed but not reported in the text. We also present in tables A.15 and A.16 the results obtained using an eight variable VAR which includes output growth, inflation, the nominal rate an expectation measure and consumption growth, investment growth, hours and the growth rate of money. Consumption growth is measured by the year-to-year change in real nondurable private consumption, investment by the year to year change in fixed private investments, hours by total hours in the non-farm business sector and money growth by the year to year change in M2. Two lags are sufficient to whiten the residuals of this system. In the larger scale VAR inflation expectations have an even smaller predictive role in the first part of the sample. Hence, it is harder to find a break in the importance of inflation expectations over time.

Orphanides (2004) and Orphanides and Williams (2005) have pointed out that policy decisions are typically taken when preliminary estimates of the relevant quantities are available while empirical analyses trying to understand how policymakers historically behaved, typically employ final estimates. For our exercises, this is a relevant concern since the presence of measurement errors could reduce the ability of our tests to detect breaks. To examine the relevance of this problem we have simulated data from the model assuming that private agents take decisions using the correct data while the central bank rule is

$$R_t = \phi_r R_{t-1} + (1 - \phi_r)[\phi_\pi(\pi_t + u_{1t}) + \phi_x(x_t - z_t + u_{2t})] + e_{R,t}$$

where u_{1t} and u_{2t} are measurement errors. With the same parameterization we have used in tables 5 and 6, we have simulated two samples with 160 data points (one with 80 data from the continuity regime and 80 from the determinate regime, the other with 80 data from the orthogonality regime and 80 from the determinate regime) and applied our tests to the simulated data. We have considered two situations: classical iid and highly serially correlated measurement errors. Clearly, if measurement error is large anything can happen. Therefore, it is important to appropriately calibrate the variance and the persistence of these errors to make the simulations realistic. The size of the revision error between initial and final estimates of output growth and inflation over the last 40 years shows a small declining trend and its standard error around this trend never exceeds 10 percent of the standard error of the actual series. Therefore, it is conservative to assume that an upper bound for the standard deviations of the two measurement errors is 10 percent of the standard errors of the largest structural

shocks. We find that measurement error of both types (see tables A.17 and A.18) can not cover up structural changes if they were present.

Table A.1: F-tests, p-values, different lag length

1 lags

With Michigan expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05.4
Δ GDP	0.44	0.30	0.57	0.81	0.77	0.64	0.71	0.68
π	0.00	0.07	0.04	0.00	0.02	0.01	0.41	0.50
R	0.38	0.09	0.02	0.08	0.01	0.00	0.02	0.01

With Term structure expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05.4
Δ GDP	0.25	0.28	0.10	0.18	0.10	0.19	0.11	0.14
π	0.44	0.52	0.37	0.01	0.00	0.00	0.44	0.06
R	0.01	0.01	0.01	0.00	0.00	0.00	0.12	0.01

2 lags

With Michigan expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05.4
Δ GDP	0.49	0.35	0.76	0.85	0.96	0.67	0.90	0.49
π	0.01	0.08	0.01	0.00	0.00	0.00	0.36	0.49
R	0.41	0.01	0.05	0.12	0.00	0.05	0.03	0.01

With Term structure expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05.4
Δ GDP	0.31	0.26	0.09	0.22	0.15	0.24	0.08	0.12
π	0.50	0.51	0.45	0.02	0.00	0.00	0.37	0.04
R	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00

3 lags

With Michigan expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05.4
Δ GDP	0.62	0.55	0.95	0.98	0.69	0.72	0.97	0.91
π	0.60	0.08	0.00	0.00	0.00	0.00	0.10	0.08
R	0.16	0.07	0.20	0.18	0.00	0.01	0.05	0.02

With Term structure expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05.4
Δ GDP	0.48	0.49	0.14	0.21	0.01	0.02	0.12	0.39
π	0.52	0.50	0.16	0.00	0.00	0.00	0.72	0.27
R	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00

8 lags

With Michigan expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05.4
Δ GDP	0.06	0.24	0.02	0.00	0.26	0.13	0.16	0.22
π	0.00	0.03	0.01	0.02	0.02	0.00	0.00	0.01
R	0.11	0.10	0.53	0.42	0.01	0.06	0.18	0.05

With Term structure expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05.4
Δ GDP	0.84	0.71	0.14	0.31	0.00	0.01	0.18	0.14
π	0.10	0.04	0.13	0.25	0.00	0.01	0.67	0.34
R	0.44	0.00	0.00	0.00	0.00	0.00	0.01	0.03

The table reports the P-value for the F-test that expected inflation coefficients in the equation are all equal to zero in a VAR with 4 variables and varying lags.

Table A.2: Variances of reduced form shocks, different lag length.

1 lags

With Michigan expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	1.12	1.11	1.21	1.39	0.79	0.69	0.67	0.52
π	0.09	0.12	0.12	0.13	0.07	0.05	0.05	0.05
R	0.67	0.89	2.44	2.61	1.42	1.28	0.62	0.23
With Term structure expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	1.12	1.07	1.14	1.33	0.77	0.69	0.62	0.48
π	0.12	0.12	0.14	0.14	0.06	0.06	0.05	0.04
R	0.57	0.71	1.93	2.06	1.18	1.15	0.58	0.21
Without inflation expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	1.15	1.14	1.28	1.21	0.81	0.71	0.67	0.53
π	0.15	0.15	0.15	0.14	0.08	0.07	0.06	0.05
R	0.69	0.99	2.45	2.61	1.44	1.30	0.62	0.24

2 lags

With Michigan expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	1.03	1.01	1.17	1.31	0.71	0.65	0.62	0.45
π	0.08	0.10	0.11	0.11	0.05	0.04	0.04	0.04
R	0.62	0.86	2.03	2.33	1.24	1.22	0.51	0.18
With Term structure expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	1.01	1.00	1.11	1.26	0.69	0.64	0.59	0.44
π	0.10	0.11	0.12	0.12	0.05	0.05	0.04	0.03
R	0.52	0.64	1.78	1.99	1.09	1.11	0.52	0.18
Without inflation expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	1.05	1.04	1.18	1.31	0.71	0.66	0.62	0.46
π	0.10	0.11	0.11	0.11	0.06	0.06	0.04	0.04
R	0.63	0.97	2.15	2.46	1.38	1.30	0.55	0.20

3 lags

With Michigan expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	0.92	0.92	1.04	1.20	0.63	0.01	0.58	0.36
π	0.08	0.10	0.10	0.10	0.05	0.04	0.03	0.03
R	0.54	0.81	1.62	1.99	0.96	0.95	0.48	0.16
With Term structure expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	0.91	0.92	0.97	1.13	0.57	0.56	0.54	0.35
π	0.10	0.10	0.11	0.11	0.05	0.04	0.04	0.03
R	0.45	0.55	1.15	1.50	0.67	0.67	0.48	0.16
Without inflation expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	0.95	0.95	1.05	1.20	0.64	0.61	0.98	0.95
π	0.10	0.11	0.12	0.13	0.06	0.05	0.04	0.10
R	0.58	0.90	1.73	2.13	1.16	1.07	0.18	0.58

8 lags

With Michigan expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	0.43	0.52	0.51	0.53	0.31	0.27	0.23	0.21
π	0.04	0.05	0.05	0.06	0.03	0.03	0.02	0.02
R	0.26	0.50	1.12	1.21	0.44	0.44	0.20	0.11
With Term structure expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	0.56	0.59	0.58	0.71	0.26	0.24	0.23	0.20
π	0.05	0.05	0.06	0.07	0.03	0.03	0.02	0.02
R	0.30	0.41	0.72	0.79	0.36	0.35	0.18	0.11
Without inflation expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	0.63	0.67	0.75	0.85	0.36	0.32	0.27	0.25
π	0.07	0.08	0.08	0.08	0.04	0.04	0.03	0.03
R	0.36	0.68	1.30	1.41	0.58	0.54	0.24	0.16

Table A.3: F-tests, p-values, Using IPD inflation

With Michigan expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	0.65	0.35	0.75	0.82	0.80	0.94	0.93	0.47
π	0.55	0.15	0.15	0.19	0.13	0.04	0.20	0.22
R	0.22	0.28	0.26	0.32	0.00	0.00	0.06	0.00
With Term structure expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	0.26	0.15	0.11	0.35	0.16	0.49	0.09	0.10
π	0.04	0.06	0.05	0.06	0.23	0.73	0.77	0.80
R	0.01	0.00	0.00	0.00	0.00	0.00	0.08	0.00

The table reports the P-value for the F-test that expected inflation coefficients in the equation are all equal to zero in a VAR with 4 variables and varying lags.

Table A.4: Variances of reduced form shocks, using IPD inflation

With Michigan expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	1.04	1.03	1.17	1.32	0.71	0.66	0.61	0.44
π	0.14	0.14	0.14	0.14	0.06	0.04	0.04	0.04
R	0.50	0.87	2.15	2.40	1.29	1.26	0.50	0.18
With term structure expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	1.01	1.00	1.12	1.29	0.69	0.65	0.58	0.43
π	0.13	0.14	0.14	0.14	0.06	0.04	0.04	0.04
R	0.46	0.65	1.66	1.83	1.10	1.10	0.51	0.18
Without inflation expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	1.05	1.04	1.18	1.31	0.71	0.66	0.62	0.46
π	0.10	0.11	0.12	0.14	0.06	0.06	0.04	0.04
R	0.63	0.97	2.19	2.46	1.38	1.30	0.55	0.20

Table A.5: F-tests, p-values, Livingstone expectations

		1 lag						
sample	55:1-79:1	55:1-80:1	55:1-81:1	55:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	0.59	0.77	0.68	0.63	0.29	0.88	0.77	0.51
π	0.49	0.48	0.24	0.15	0.00	0.09	0.84	0.66
R	0.86	0.80	0.79	0.61	0.00	0.04	0.26	0.53

		2 lags						
sample	55:1-79:1	55:1-80:1	55:1-81:1	55:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	0.63	0.83	0.78	0.82	0.37	0.21	0.18	0.18
π	0.67	0.51	0.42	0.43	0.01	0.20	0.09	0.31
R	0.60	0.83	0.90	0.91	0.20	0.06	0.08	0.30

The table reports the P-value for the F-test that expected inflation coefficients in the equation are all equal to zero in a VAR with 4 variables and varying lags.

Table A.6: Variances of reduced form shocks, Livingstone expectations

		1 lags						
sample	55:1-79:1	55:1-80:1	55:1-81:1	55:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	1.21	1.42	1.47	1.47	0.83	0.81	0.81	0.72
π	0.27	0.27	0.31	0.33	0.11	0.10	0.09	0.09
R	1.43	2.04	2.21	2.28	1.03	0.62	0.62	0.50

		2 lags						
sample	55:1-79:1	55:1-80:1	55:1-81:1	55:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	0.80	1.13	1.18	1.19	0.48	0.36	0.37	0.37
π	0.21	0.20	0.19	0.19	0.08	0.08	0.07	0.07
R	1.12	1.75	1.86	2.03	0.81	0.47	0.46	0.40

		Without inflation expectations, 1 lags						
sample	55:1-79:1	55:1-80:1	55:1-81:1	55:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	1.26	1.44	1.51	1.50	0.88	0.81	0.82	0.72
π	0.28	0.28	0.33	0.33	0.16	0.11	0.09	0.09
R	1.44	2.07	2.24	2.34	1.15	0.72	0.66	0.52

		Without inflation expectations, 2 lags						
sample	55:1-79:1	55:1-80:1	55:1-81:1	55:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	0.83	1.17	1.22	1.23	0.53	0.39	0.40	0.40
π	0.22	0.22	0.20	0.20	0.09	0.09	0.08	0.08
R	1.15	1.79	1.90	2.08	0.84	0.49	0.49	0.43

Table A.7: F-tests, p-values, Greenbook expectations

sample	65:4-79:1	65:4-80:1	65:4-81:1	65:4-82:1	79:2-01:4	80:2-01:4	81:2-01:4	81:2-01.4
Δ GDP	0.54	0.25	0.01	0.00	0.82	0.10	0.21	0.10
π	0.14	0.14	0.13	0.00	0.00	0.00	0.11	0.39
R	0.71	0.04	0.38	0.33	0.36	0.60	0.12	0.19

The table reports the P-value for the F-test that expected inflation coefficients in the equation are all equal to zero in a VAR with 4 variables and two lags.

Table A.8: Variances of reduced form shocks, Greenbook expectations

sample	With inflation expectations							
	65:4-79:1	65:4-80:1	65:4-81:1	65:4-82:1	79:2-01:4	80:2-01:4	81:2-01:4	81:2-01.4
Δ GDP	0.87	0.84	0.96	1.11	0.79	0.68	0.66	0.47
π	0.09	0.12	0.13	0.13	0.04	0.04	0.03	0.03
R	0.77	1.10	2.73	3.08	1.37	1.33	0.57	0.19
sample	Without inflation expectations							
	65:4-79:1	65:4-80:1	65:4-81:1	65:4-82:1	79:2-01:4	80:2-01:4	81:2-01:4	81:2-01.4
Δ GDP	1.00	1.00	1.21	1.38	0.79	0.73	0.69	0.51
π	0.12	0.12	0.14	0.16	0.06	0.05	0.04	0.03
R	0.78	1.21	2.77	3.12	1.41	1.35	0.60	0.20

Table A.9: F-tests, p-values, Using output growth expectations

Greenbook forecasts, output and inflation expectations								
Lags of inflation expectations								
sample	65:4-79:1	65:4-80:1	65:4-81:1	65:4-82:1	79:2-01:4	80:2-01:4	81:2-01:4	81:2-01.4
Δ GDP	0.57	0.26	0.02	0.00	0.28	0.05	0.21	0.04
π	0.00	0.14	0.16	0.02	0.00	0.00	0.06	0.30
R	0.32	0.06	0.33	0.24	0.59	0.98	0.15	0.09
Lags of output growth expectations								
sample	65:4-79:1	65:4-80:1	65:4-81:1	65:4-82:1	79:2-01:4	80:2-01:4	81:2-01:4	81:2-01.4
Δ GDP	0.58	0.71	0.28	0.06	0.02	0.18	0.24	0.13
π	0.95	0.94	0.94	0.49	0.30	0.58	0.32	0.72
R	0.58	0.82	0.17	0.03	0.04	0.03	0.69	0.16
Greenbook forecasts, output expectations only								
sample	65:4-79:1	65:4-80:1	65:4-81:1	65:4-82:1	79:2-01:4	80:2-01:4	81:2-01:4	81:2-01.4
Δ GDP	0.55	0.72	0.29	0.11	0.06	0.33	0.24	0.29
π	0.96	0.91	0.93	0.20	0.47	0.58	0.54	0.95
R	0.57	0.84	0.18	0.04	0.02	0.01	0.57	0.35
Professional forecasts, output and inflation expectations								
Lags of inflation expectations								
sample	68:1-79:1	68:1-80:1	68:1-81:1	68:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	0.48	0.49	0.09	0.04	0.00	0.00	0.30	0.11
π	0.01	0.05	0.29	0.04	0.00	0.00	0.05	0.40
R	0.40	0.64	0.53	0.49	0.00	0.00	0.00	0.00
Lags of output growth expectations								
sample	68:1-79:1	68:1-80:1	68:1-81:1	68:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	0.00	0.03	0.03	0.00	0.02	0.00	0.05	0.22
π	0.13	0.06	0.54	0.33	0.22	0.63	0.80	0.81
R	0.77	0.19	0.60	0.34	0.02	0.03	0.06	0.71
Professional forecasts, output expectations only								
sample	68:1-79:1	68:1-80:1	68:1-81:1	68:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	0.00	0.01	0.04	0.01	0.10	0.03	0.17	0.33
π	0.20	0.10	0.48	0.15	0.02	0.31	0.76	0.65
R	0.46	0.19	0.62	0.36	0.07	0.67	0.10	0.18

The table reports the P-value for the F-test that expected output coefficients in the equation are all equal to zero in a VAR with 4 variables and two lags.

Table A.10: Variances of reduced form shocks, systems with output growth expectations

Greenbook forecasts, output and inflation expectations								
sample	65:4-79:1	65:4-80:1	65:4-81:1	65:4-82:1	79:2-01:4	80:2-01:4	81:2-01:4	81:2-01.4
Δ GDP	0.85	0.83	0.92	1.00	0.71	0.65	0.64	0.45
π	0.09	0.12	0.13	0.13	0.04	0.04	0.03	0.03
R	0.75	1.09	2.55	2.72	1.27	1.22	0.56	0.18
Greenbook forecasts, output expectations only								
sample	65:4-79:1	65:4-80:1	65:4-81:1	65:4-82:1	79:2-01:4	80:2-01:4	81:2-01:4	81:2-01.4
Δ GDP	0.87	1.21	1.07	1.22	0.74	0.71	0.67	0.49
π	0.12	0.14	0.14	0.15	0.06	0.05	0.04	0.03
R	1.21	1.24	2.66	2.87	1.29	1.22	0.59	0.19
Without expectations								
sample	65:4-79:1	65:4-80:1	65:4-81:1	65:4-82:1	79:2-01:4	80:2-01:4	81:2-01:4	81:2-01.4
Δ GDP	1.00	1.00	1.21	1.38	0.79	0.73	0.69	0.51
π	0.12	0.12	0.14	0.16	0.06	0.05	0.04	0.03
R	0.78	1.21	2.77	3.12	1.41	1.35	0.60	0.20
Professional forecasts, output and inflation expectations								
sample	68:1-79:1	68:1-80:1	68:1-81:1	68:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	0.60	0.78	0.82	1.07	0.62	0.56	0.55	0.44
π	0.09	0.09	0.13	0.14	0.05	0.05	0.04	0.04
R	0.84	1.01	3.14	3.17	1.15	1.12	0.46	0.27
Professional forecasts, output expectations only								
sample	68:1-79:1	68:1-80:1	68:1-81:1	68:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	0.63	0.81	0.93	1.24	0.74	0.66	0.65	0.46
π	0.12	0.11	0.13	0.16	0.06	0.05	0.04	0.04
R	0.89	1.04	3.25	3.27	1.33	1.31	0.53	0.30
Without expectations								
sample	68:1-79:1	68:1-80:1	68:1-81:1	68:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	0.94	0.97	1.13	1.43	0.78	0.71	0.67	0.48
π	0.13	0.12	0.14	0.17	0.06	0.06	0.04	0.04
R	0.90	1.09	3.23	3.33	1.40	1.38	0.56	0.31

The table reports the P-value for the F-test that expected output coefficients in the equation are all equal to zero in a VAR with 4 variables and two lags.

Table A.11: F-tests, p-values, First principal component of expectations

sample	74:1-79:1	74:1-80:1	74:1-81:1	74:1-82:1	79:2-01:4	80:2-01:4	81:2-01:4	81:2-01.4
Δ GDP	0.09	0.33	0.43	0.45	0.12	0.01	0.00	0.02
π	0.66	0.05	0.40	0.71	0.02	0.00	0.77	0.78
R	0.53	0.08	0.02	0.08	0.00	0.02	0.03	0.08

The table reports the P-value for the F-test that the first principal component of expected inflation coefficients in the equation are all equal to zero in a VAR with 4 variables and two lags.

Table A.12: Variances of reduced form shocks, First principal component of expectations

sample	With expectations							
	74:1-79:1	74:1-80:1	74:1-81:1	74:1-82:1	79:2-01:4	80:2-01:4	81:2-01:4	81:2-01.4
Δ GDP	0.83	0.95	1.29	1.59	0.75	0.65	0.60	0.45
π	0.03	0.05	0.09	0.11	0.05	0.05	0.04	0.03
R	0.93	1.36	3.39	4.32	1.23	1.22	0.55	0.18
sample	Without expectations							
	65:4-79:1	65:4-80:1	65:4-81:1	65:4-82:1	79:2-01:4	80:2-01:4	81:2-01:4	81:2-01.4
Δ GDP	1.27	1.11	1.41	1.70	0.79	0.73	0.69	0.51
π	0.04	0.08	0.10	0.12	0.06	0.05	0.04	0.03
R	1.04	1.89	5.03	5.34	1.41	1.35	0.60	0.20

Table A.13: F-tests, p-values, FAVAR system

With Michigan expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	0.00	0.00	0.00	0.00	0.19	0.22	0.05	0.05
π	0.15	0.74	0.49	0.29	0.00	0.00	0.02	0.03
R	0.31	0.00	0.00	0.06	0.00	0.02	0.04	0.00
PC	0.04	0.11	0.19	0.08	0.05	0.25	0.42	0.50
With Term structure expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	0.13	0.09	0.18	0.24	0.06	0.07	0.10	0.12
π	0.41	0.34	0.03	0.02	0.00	0.00	0.46	0.05
R	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.06
PC	0.08	0.96	0.54	0.40	0.62	0.46	0.19	0.44

The table reports the P-value for the F-test that expected inflation coefficients in the equation are all equal to zero in a VAR with 8 variables and two lags.

Table A.14: Variances of reduced form shocks, FAVAR system

With Michigan expectations								
sample	55:1-79:1	55:1-80:1	55:1-81:1	55:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	0.65	0.64	0.67	0.78	0.53	0.51	0.49	0.33
π	0.05	0.07	0.07	0.08	0.04	0.03	0.02	0.02
R	0.57	0.81	1.62	1.98	1.13	1.11	0.51	0.17
PC	5.09	5.12	6.27	6.33	3.06	2.74	2.66	2.02
With Term structure expectations								
sample	55:1-79:1	55:1-80:1	55:1-81:1	55:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	0.72	0.71	0.77	0.90	0.52	0.49	0.48	0.34
π	0.05	0.06	0.07	0.07	0.04	0.03	0.03	0.02
R	0.49	0.61	1.54	1.81	1.06	1.08	0.52	0.18
PC	5.09	5.98	6.38	6.55	3.38	2.77	2.61	2.70
Without inflation expectations								
sample	55:1-79:1	55:1-80:1	55:1-81:1	55:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	0.77	0.76	0.81	0.93	0.55	0.52	0.50	0.36
π	0.06	0.07	0.08	0.08	0.05	0.04	0.03	0.02
R	0.59	0.93	1.78	2.13	1.27	1.20	0.55	0.19
PC	5.59	6.00	6.63	6.65	3.39	2.88	2.80	2.72

Table A.15: F-tests, p-values, Large VAR

With Michigan expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	0.60	0.15	0.58	0.01	0.41	0.57	0.95	0.90
π	0.94	0.90	0.96	0.71	0.95	0.90	0.97	0.96
Δ C	0.43	0.31	0.50	0.93	0.42	0.30	0.16	0.24
Δ I	0.18	0.14	0.26	0.11	0.14	0.16	0.06	0.04
Hours	0.91	0.88	0.75	0.78	0.29	0.22	0.35	0.30
Δ M	0.24	0.33	0.06	0.10	0.59	0.65	0.72	0.89
R	0.21	0.39	0.05	0.08	0.44	0.31	0.48	0.01
With Term structure expectations								
sample	60:1-79:2	60:1-80:2	60:1-81:2	60:1-82:2	79:3-05:4	80:3-05:4	81:3-05:4	82:3-05:4
Δ GDP	0.60	0.35	0.73	0.39	0.60	0.68	0.83	0.87
π	0.74	0.84	0.43	0.84	0.96	0.68	0.38	0.50
Δ C	0.20	0.58	0.61	0.37	0.07	0.69	0.59	0.53
Δ I	0.33	0.41	0.25	0.73	0.38	0.03	0.19	0.16
Hours	0.92	0.57	0.97	0.99	0.60	0.52	0.59	0.64
Δ M	0.11	0.47	0.85	0.55	0.84	0.51	0.70	0.73
R	0.50	0.33	0.38	0.06	0.19	0.10	0.22	0.19

The table reports the P-value for the F-test that expected inflation coefficients in the equation are all equal to zero in a VAR with 8 variables and two lags.

Table A.16: Variances of reduced form shocks, Large VAR

With Michigan expectations								
sample	55:1-79:1	55:1-80:1	55:1-81:1	55:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	1.06	1.14	1.20	1.32	0.60	0.58	0.44	0.45
π	0.30	0.30	0.30	0.32	0.31	0.30	0.31	0.29
Δ C	0.48	0.59	0.61	0.62	0.32	0.21	0.21	0.21
Δ I	9.09	10.2	11.0	10.6	5.04	4.07	2.95	2.91
Hours	0.40	0.45	0.43	0.42	0.59	0.55	0.55	0.56
Δ M	362.3	371.8	371.7	370.8	142.6	135.1	118.9	112.2
R	0.16	0.18	0.19	0.22	0.24	0.20	0.18	0.18
With Term structure expectations								
sample	55:1-79:1	55:1-80:1	55:1-81:1	55:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	0.33	0.46	0.99	1.14	0.63	0.61	0.47	0.47
π	0.30	0.30	0.30	0.31	0.31	0.30	0.31	0.29
Δ C	0.59	0.38	0.44	0.60	0.39	0.21	0.21	0.21
Δ I	2.09	6.02	6.78	7.80	5.26	3.91	2.99	2.92
Hours	0.22	0.31	0.44	0.42	0.59	0.55	0.54	0.56
Δ M	128.9	210.9	315.4	306.2	158.9	146.2	127.9	117.6
R	0.10	0.18	0.25	0.25	0.23	0.18	0.17	0.16
Without inflation expectations								
sample	55:1-79:1	55:1-80:1	55:1-81:1	55:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	1.08	1.21	1.22	1.49	0.61	0.59	0.45	0.45
π	0.30	0.30	0.30	0.32	0.31	0.30	0.31	0.30
Δ C	0.50	0.62	0.62	0.62	0.40	0.22	0.22	0.21
Δ I	9.63	10.8	11.5	11.3	5.26	4.25	3.16	3.16
Hours	0.40	0.45	0.44	0.42	0.61	0.57	0.56	0.57
Δ M	380.3	385.3	403.7	395.8	144.3	136.5	119.8	112.5
R	0.17	0.19	0.21	0.23	0.24	0.20	0.19	0.18

Table A.17: F-tests, p-values, Simulated data with measurement error

Continuity Solution, iid errors								
sample	60:1-78:4	60:1-79:4	60:1-80:4	60:1-81:4	79:1-99:4	80:1-99:4	81:1-99:4	82:1-99:4
Δ GDP	0.00	0.00	0.05	0.07	0.16	0.10	0.92	0.70
π	0.14	0.17	0.23	0.94	0.16	0.20	0.26	0.32
R	0.05	0.05	0.10	0.17	0.10	0.10	0.25	0.26
Orthogonality Solution, iid errors								
sample	60:1-78:4	60:1-79:4	60:1-80:4	60:1-81:4	79:1-99:4	80:1-99:4	81:1-99:4	82:1-99:4
Δ GDP	0.05	0.05	0.10	0.34	0.74	0.30	0.92	0.70
π	0.36	0.28	0.60	0.05	0.23	0.25	0.26	0.32
R	0.61	0.63	0.82	0.68	0.10	0.15	0.25	0.26
Continuity Solution, AR errors								
sample	60:1-78:4	60:1-79:4	60:1-80:4	60:1-81:4	79:1-99:4	80:1-99:4	81:1-99:4	82:1-99:4
Δ GDP	0.00	0.00	0.04	0.07	0.16	0.10	0.92	0.70
π	0.12	0.14	0.21	0.90	0.16	0.20	0.26	0.32
R	0.04	0.05	0.09	0.15	0.10	0.10	0.25	0.26

The table reports the P-value for the F-test that expected inflation coefficients in the equation are all equal to zero in a VAR with 4 variables and two lags. Data from 1960:1 to 1979:4 are generated from the indeterminate solution, data from 1980:1 to 1999:4 are generated from the determinate solution. When measurement error is serially correlated, the persistence coefficient is set to 0.9.

Table A.18: Variances of reduced form shocks, Simulated data with measurement error

Continuity solution, iid errors								
sample	60:1-78:4	60:1-79:4	60:1-80:4	60:1-81:4	79:1-99:4	80:1-99:4	81:1-99:4	82:1-99.4
Δ GDP	3.47	3.42	3.41	3.31	0.18	0.07	0.05	0.05
π	1.67	1.66	1.72	1.70	1.65	1.64	1.62	1.70
R	1.41	1.41	1.40	1.36	0.18	0.12	0.11	0.12
Orthogonality Solution, iid errors								
sample	60:1-78:4	60:1-79:4	60:1-80:4	60:1-81:4	79:1-99:4	80:1-99:4	81:1-99:4	82:1-99.4
Δ GDP	1.38	1.40	1.72	1.69	0.50	0.13	0.05	0.05
π	0.19	0.19	0.29	0.30	1.57	1.64	1.62	1.70
R	0.52	0.52	0.56	0.53	0.15	0.12	0.11	0.12
Without inflation expectations, Continuity solution, iid errors								
sample	55:1-79:1	55:1-80:1	55:1-81:1	55:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	3.82	3.74	3.58	3.44	0.19	0.08	0.05	0.05
π	1.72	1.71	1.76	1.70	1.69	1.68	1.65	1.73
R	1.49	1.48	1.45	1.39	0.18	0.13	0.12	0.12
Without inflation expectations, Orthogonality solution, iid errors								
sample	55:1-79:1	55:1-80:1	55:1-81:1	55:1-82:1	79:2-06:1	80:2-06:1	81:2-06:1	81:2-06.1
Δ GDP	1.35	1.37	1.66	1.61	0.47	0.12	0.05	0.05
π	0.18	0.18	0.29	0.27	1.57	1.64	1.61	1.67
R	0.53	0.52	0.56	0.54	0.15	0.11	0.11	0.11