

SUPPLEMENTARY RESULTS

Forecasting with Shadow-Rate VARs*

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Abstract

This online appendix provides additional results that complement the results shown in our paper.

PRELIMINARY AND INCOMPLETE

*The views expressed herein are solely those of the authors and do not necessarily reflect the views of the Federal Reserve Bank of Cleveland, the Federal Reserve System, the Eurosystem or the Deutsche Bundesbank.

List of Tables

S.1	Relative RMSE of mean forecasts (through 2017:12)	S.2
S.2	Relative MAE of median forecasts (through 2017:12)	S.3
S.3	Relative CRPS of density forecasts (through 2017:12)	S.4
S.4	Comparison against VAR with Krippner shadow rates (through 2017:12) . .	S.5
S.5	Comparison against VAR with Wu-Xia shadow rates (through 2017:12) . . .	S.6
S.6	Relative MAD of median forecasts (through 2020:09)	S.7
S.7	Relative MAD of median forecasts (through 2017:12)	S.8
S.8	Using 20-year yield: Relative RMSE of mean forecasts (through 2020:09) . .	S.9
S.9	Using 20-year yield: Relative MAE of median forecasts (through 2020:09) . .	S.10
S.10	Using 20-year yield: Relative MAD of median forecasts (through 2020:09) . .	S.11
S.11	Using 20-year yield: Relative CRPS of density forecasts (through 2020:09) .	S.12
S.12	Using 20-year yield: Relative RMSE of mean forecasts (through 2017:12) . .	S.13
S.13	Using 20-year yield: Relative MAE of median forecasts (through 2017:12) . .	S.14
S.14	Using 20-year yield: Relative MAD of median forecasts (through 2017:12) . .	S.15
S.15	Using 20-year yield: Relative CRPS of density forecasts (through 2017:12) .	S.16
S.16	Using 3-month Tbill: Relative RMSE of mean forecasts (through 2020:09) .	S.17
S.17	Using 3-month Tbill: Relative MAE of median forecasts (through 2020:09) .	S.18
S.18	Using 3-month Tbill: Relative MAD of median forecasts (through 2020:09) .	S.19
S.19	Using 3-month Tbill: Relative CRPS of density forecasts (through 2020:09) .	S.20
S.20	Using 3-month Tbill: Relative RMSE of mean forecasts (through 2017:12) .	S.21
S.21	Using 3-month Tbill: Relative MAE of median forecasts (through 2017:12) .	S.22
S.22	Using 3-month Tbill: Relative MAD of median forecasts (through 2017:12) .	S.23
S.23	Using 3-month Tbill: Relative CRPS of density forecasts (through 2017:12) .	S.24
S.24	ELB set to 12.5bp: Relative RMSE of mean forecasts (through 2020:09) . . .	S.25
S.25	ELB set to 12.5bp: Relative MAE of median forecasts (through 2020:09) . .	S.26
S.26	ELB set to 12.5bp: Relative MAD of median forecasts (through 2020:09) . .	S.27
S.27	ELB set to 12.5bp: Relative CRPS of density forecasts (through 2020:09) . .	S.28
S.28	ELB set to 12.5bp: Relative RMSE of mean forecasts (through 2017:12) . . .	S.29
S.29	ELB set to 12.5bp: Relative MAE of median forecasts (through 2017:12) . .	S.30
S.30	ELB set to 12.5bp: Relative MAD of median forecasts (through 2017:12) . .	S.31
S.31	ELB set to 12.5bp: Relative CRPS of density forecasts (through 2017:12) . .	S.32

Table S.1: Relative RMSE of mean forecasts (through 2017:12)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	8.06	7.69	7.81	8.29	1.00	1.01	1.02	1.00	1.00	1.00	1.00	0.96**
Real Consumption	3.17	2.98	2.95	3.36	1.01*	1.01	1.01	0.92	1.01	1.03*	1.06	1.05
IP	5.98	6.33	6.00	6.80	1.00	1.06	1.06	0.95	1.02	1.00	1.10**	1.11**
Capacity Utilization	0.70	1.27	2.06	3.42	1.02	1.10	1.28	1.38	1.05*	1.04	1.16**	1.39***
Unemployment	0.22	0.28	0.45	0.88	1.00	1.01	1.17***	1.50***	1.02	1.06	1.09	1.17
Nonfarm Payrolls	1.28	1.38	1.32	1.51	1.01**	1.07*	1.31	1.50**	0.99	0.98	1.07	1.30**
Hours	0.20	0.25	0.29	0.35	1.00	1.04	1.28	1.67	1.04***	1.06**	1.07	1.23***
Hourly Earnings	2.28	2.33	2.40	2.77	1.00	0.98	0.96	0.91**	1.00	1.01	1.00	0.95***
PPI (Fin. Goods)	7.66	7.48	7.60	7.76	1.00	0.98	0.95	0.91	1.03	1.03	1.04	0.99
PPI (Metals)	40.22	39.88	37.00	29.45	1.00	1.00	0.99	1.01	1.01	1.01	1.01	0.99*
PCE Prices	2.25	2.31	2.64	3.17	0.97*	0.94*	0.88	0.74	1.08*	1.09*	1.12	1.07
Federal Funds Rate	0.47	0.97	1.59	1.88	0.37	0.40	0.55	1.01	0.21	0.18	0.23	0.49**
Housing Starts	0.09	0.12	0.21	0.36	0.99	0.99	1.00	1.08	1.05	1.08	1.05	0.95
S&P 500	38.81	34.85	35.38	32.99	1.02	1.04	1.05	1.06	0.97*	0.98	0.99	0.99
USD / GBP FX Rate	26.66	24.58	24.31	23.55	1.01	1.00	1.00	1.02	0.98	0.98**	0.99	0.97**
5-Year Yield	0.46	0.73	1.03	1.33	1.02	1.06	1.35	1.97	0.95	0.87*	0.68***	0.64**
10-Year Yield	0.47	0.72	0.98	1.14	1.02	1.08**	1.40	2.33	0.97	0.93	0.74*	0.56***
Baa Spread	0.73	1.36	1.83	1.45	1.02	1.05	1.26	2.28	0.98	0.96	0.89	0.83

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2017:12. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags.

Table S.2: Relative MAE of median forecasts (through 2017:12)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	3.96	3.71	3.71	3.71	1.01*	1.03	1.08	0.97	1.00	0.99	1.00	0.99
Real Consumption	2.37	2.16	2.19	2.64	1.01	1.02	1.04	0.89	1.02	1.01	1.10*	1.02
IP	4.73	5.02	4.86	5.31	0.99	1.04	1.04	0.93	1.04*	1.01	1.12**	1.19**
Capacity Utilization	0.55	0.97	1.61	2.68	1.01	1.06	1.20	1.22	1.06**	1.09	1.20**	1.52***
Unemployment	0.17	0.23	0.38	0.78	1.00	1.01	1.19***	1.43***	1.03*	1.05	1.05	1.07
Nonfarm Payrolls	0.97	1.06	1.05	1.29	1.01	1.05*	1.21**	1.41***	1.00	1.02	1.13	1.31*
Hours	0.16	0.19	0.23	0.27	0.99	1.03	1.18	1.53*	1.04*	1.06**	1.10	1.27**
Hourly Earnings	1.74	1.74	1.82	2.20	1.01	0.99	0.92	0.87**	1.00	1.03	1.01	0.97*
PPI (Fin. Goods)	5.99	5.92	5.97	6.17	1.00	0.98	0.96	0.92	1.02	1.01	1.02	0.99
PPI (Metals)	29.80	29.78	27.71	22.52	1.00	1.00	0.99	1.01	1.01	1.00	1.00	1.00
PCE Prices	1.78	1.83	2.10	2.57	0.97**	0.95*	0.86**	0.74*	1.06	1.08	1.10	1.06
Federal Funds Rate	0.25	0.52	0.95	1.44	0.42*	0.52	0.65	0.76	0.16***	0.14**	0.19**	0.32***
Housing Starts	0.07	0.10	0.16	0.25	1.01	0.97	0.96	1.12	1.03	1.02	0.93	0.83
S&P 500	28.42	26.32	26.87	24.29	1.02*	1.04	1.03	1.06	0.96**	0.97*	0.97	0.99
USD / GBP FX Rate	19.35	18.07	18.13	17.84	1.01	1.01	1.01	1.04	0.98**	0.98***	0.98*	0.96**
5-Year Yield	0.36	0.59	0.84	1.06	1.02	1.03	1.32	1.60	0.92	0.92	0.75	0.69*
10-Year Yield	0.36	0.57	0.82	0.90	1.03*	1.07*	1.36	1.89	0.96	0.96	0.78	0.74
Baa Spread	0.47	0.79	1.15	1.09	1.00	1.01	1.04	1.26	1.02	1.04	0.97	0.92

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2017:12. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags.

Table S.3: Relative CRPS of density forecasts (through 2017:12)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	3.30	3.23	3.42	3.86	1.01*	1.01	1.03	1.01	0.99	1.00	1.01*	1.03
Real Consumption	1.83	1.80	1.95	2.49	1.01*	1.01	1.01	0.99	1.01	1.02**	1.05**	1.05
IP	3.45	3.73	3.84	4.62	1.00	1.02	1.02	0.99	1.03*	1.02	1.08***	1.11***
Capacity Utilization	0.42	0.74	1.29	2.25	1.01	1.05	1.13	1.17**	1.05***	1.07*	1.15***	1.29***
Unemployment	0.12	0.17	0.29	0.57	1.00	1.02**	1.11***	1.31***	1.02	1.03	1.06	1.08
Nonfarm Payrolls	0.71	0.78	0.87	1.17	1.01**	1.05**	1.13*	1.21***	1.00	1.01	1.07*	1.15***
Hours	0.12	0.14	0.18	0.25	1.00	1.03*	1.15*	1.28**	1.05***	1.07***	1.09**	1.19***
Hourly Earnings	1.30	1.34	1.43	1.83	1.00	0.99	0.98	0.97***	1.00	1.01	1.00	1.00
PPI (Fin. Goods)	4.32	4.33	4.44	4.84	1.00	0.99	0.98	0.97	1.01	1.02	1.02	1.00
PPI (Metals)	21.79	21.74	21.30	20.58	1.00	1.00	0.99	1.01	1.00	1.00	1.00	1.01*
PCE Prices	1.27	1.35	1.50	1.91	0.98**	0.96*	0.93	0.89*	1.05	1.06	1.08	1.05
Federal Funds Rate	0.18	0.38	0.71	1.09	0.40**	0.47	0.58	0.70	0.15***	0.14**	0.18**	0.31***
Housing Starts	0.05	0.07	0.11	0.19	1.00	1.01	1.03	1.13	1.01	1.00	0.95	0.89
S&P 500	20.98	20.18	21.49	23.03	1.01	1.02	1.02	1.02	0.98	0.99	1.00	1.02***
USD / GBP FX Rate	14.62	14.12	14.22	15.40	1.01	1.00	1.00	1.02	0.98**	0.99*	0.99	0.99
5-Year Yield	0.26	0.42	0.60	0.82	1.02	1.05	1.25	1.42	0.94	0.89	0.75**	0.66***
10-Year Yield	0.26	0.41	0.57	0.71	1.02*	1.07**	1.30*	1.64	0.97	0.93	0.81	0.77**
Baa Spread	0.33	0.57	0.79	0.90	1.01	1.01	1.07	1.22	1.01	1.01	0.97	1.00

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2017:12. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags.

Table S.4: Comparison against VAR with Krippner shadow rates (through 2017:12)

Variable / Horizon	RMSE				MAE				CRPS			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	0.99*	0.99*	0.99	0.93**	0.98*	0.99	0.99	0.99	0.98***	0.99	0.99	0.98
Real Consumption	1.01	0.97*	0.94	0.92*	1.01	0.96	0.95	0.90**	1.01	0.98*	0.95	0.96
IP	1.02	1.04	1.05	0.94**	1.04	1.05	1.06	0.95	1.02	1.03	1.03	0.98
Capacity Utilization	1.05	1.09	1.12	1.13	1.05	1.08	1.14	1.14	1.03	1.05	1.07	1.06
Unemployment	0.91	0.85*	0.85**	1.10	0.96	0.87*	0.82*	1.07	0.94	0.88**	0.88**	0.98
Nonfarm Payrolls	0.96	0.93	0.96	1.00	0.97	1.00	0.97	0.99	0.98	0.96	0.96**	0.95
Hours	0.95	0.93	0.93	1.03	0.97	0.95	0.95	1.01	0.98	0.96	0.96	1.04
Hourly Earnings	1.00	1.01	1.02	0.96*	0.99	1.00	0.98	0.97	0.99	1.01	1.01	1.01
PPI (Fin. Goods)	0.99	0.98	0.96**	0.96	0.98	0.97	0.96	0.96	0.98	0.97*	0.96*	0.98
PPI (Metals)	0.99*	0.99	0.99	0.98*	0.98*	0.99	0.99	0.98*	0.98**	0.99**	0.99	0.99
PCE Prices	0.98	0.95*	0.94**	0.91*	0.98	0.95**	0.94*	0.92	0.97	0.95**	0.94**	0.94*
Policy Rate	0.88	0.76	0.78*	1.01	1.07	0.77	0.73	0.96	1.02	0.81	0.80	0.97
Housing Starts	1.02	1.06	1.10	1.01	0.97	1.00	0.97	0.86	0.98	0.99	0.97	0.90
S&P 500	0.99	1.00	1.00	0.98*	0.95*	0.99	0.99	0.96***	0.97	0.99	0.98	0.99
USD / GBP FX Rate	1.00	1.00	1.01	0.99	1.02	1.01	1.02	0.99	1.00	1.00	1.01	0.99
5-Year Yield	1.11**	1.14**	1.14	1.04	1.04	1.06	0.97	0.83*	1.01	1.03	0.99	0.88*
10-Year Yield	1.01	1.01	0.95	0.84	0.97	0.98	0.90	0.70*	0.97	0.96	0.90	0.80**
Baa Spread	1.11	1.12	0.99	0.75**	0.96	0.91	0.87	0.73*	0.96	0.95	0.87	0.81***

Note: Comparison of “Krippner (plug-in VAR)” (baseline, in denominator) against “Shadow-rate VAR.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2017:12. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags.

Table S.5: Comparison against VAR with Wu-Xia shadow rates (through 2017:12)

Variable / Horizon	RMSE			MAE			CRPS					
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	1.00	0.99**	0.99	0.95***	0.99	0.95**	0.95	0.98	0.99	0.97**	0.98	1.00
Real Consumption	1.00	0.99	1.00	1.01	0.98	0.96	1.00	0.99	1.00	1.00	1.00	1.02
IP	1.02**	1.02	1.02	0.97*	1.04**	1.03	1.03	1.00	1.03**	1.03*	1.02	1.02
Capacity Utilization	0.99	0.99	1.00	1.04	0.98	0.99	1.02	1.07	0.99	0.99	0.99	1.01
Unemployment	0.94*	0.89**	0.90**	1.05	0.96	0.86***	0.88**	1.08	0.95**	0.90***	0.91***	0.98
Nonfarm Payrolls	0.96	0.93	0.98	1.10	0.95*	0.97	1.01	1.16	0.97*	0.95*	0.98	1.04
Hours	0.95**	0.91**	0.90*	1.00	0.94***	0.90**	0.91	1.00	0.97*	0.93**	0.94	1.05
Hourly Earnings	0.99	0.99	0.98	0.96*	1.00	1.01	0.98	0.97	0.99	1.00	0.99	1.01
PPI (Fin. Goods)	1.03	1.02	1.02	0.97	1.02	1.02	1.03**	0.97	1.02	1.02	1.02	0.99
PPI (Metals)	1.00	1.00	1.00	0.99	0.99	0.99	1.00	0.99*	0.99	1.00	1.00	1.01
PCE Prices	1.01	1.00	1.01	0.98	1.01	0.99	0.98	0.98	0.99	0.99	0.99	0.98
Policy Rate	0.68	0.74*	0.89	1.11**	0.72	0.70*	0.78*	0.96	0.69	0.75*	0.89	1.00
Housing Starts	1.02	1.08	1.15	1.14	1.01	1.02	1.01	0.94	0.99	1.00	1.02	1.00
S&P 500	1.01	0.99	0.99	0.99	0.96*	0.98*	0.98*	0.99	0.99	0.99	0.99	1.02**
USD / GBP FX Rate	0.98	0.99	1.00	0.98	0.99	0.99	1.00	0.99	0.98	0.99	1.00	1.00
5-Year Yield	1.09	1.11	1.14	1.10	1.02	1.01	0.92	0.87	1.03	1.03	1.00	0.94
10-Year Yield	1.05	1.06	1.02	0.86*	1.01	1.03	1.01	0.81	1.02	1.03	0.98	0.87*
Baa Spread	1.20	1.22	1.09	0.86	1.07	1.04	0.99	0.87	1.06	1.07	1.01	0.97

Note: Comparison of “Wu-Xia (plug-in VAR)” (baseline, in denominator) against “Shadow-rate VAR.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2017:12. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags.

Table S.6: Relative MAD of median forecasts (through 2020:09)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	2.46	2.47	2.34	2.16	1.06	1.01	1.15	1.03	1.00	1.04	0.99	1.07
Real Consumption	1.76	1.62	1.74	2.39	1.05	1.03	1.06	0.89	1.06	1.01	1.11	0.95
IP	4.30	4.23	4.51	5.38	0.90	1.02	1.09	0.85	1.06	1.06	1.15	1.10
Capacity Utilization	0.45	0.82	1.27	2.10	1.04	1.04	1.09	1.15	1.16	1.24	1.39	1.92
Unemployment	0.14	0.20	0.35	0.79	1.05	1.05	1.20	1.39	1.08	1.13	1.13	1.00
Nonfarm Payrolls	0.76	1.02	1.05	1.41	1.02	1.03	1.19	1.32	1.05	1.09	1.30	1.30
Hours	0.15	0.16	0.21	0.23	1.00	1.01	0.99	1.37	1.02	1.10	1.06	1.29
Hourly Earnings	1.47	1.35	1.42	1.89	1.01	1.00	0.80	0.87	1.05	1.00	1.10	0.99
PPI (Fin. Goods)	4.85	4.87	4.76	5.72	1.03	1.00	0.99	0.91	1.06	0.94	0.94	0.89
PPI (Metals)	20.38	20.72	19.44	18.11	1.00	1.02	1.00	1.02	0.99	1.00	0.98	1.07
PCE Prices	1.33	1.47	1.78	2.08	1.03	0.93	0.86	0.85	1.07	1.05	1.02	1.08
Federal Funds Rate	0.15	0.28	0.54	0.97	0.76	1.01	1.11	1.10	0.00	0.00	0.00	0.00
Housing Starts	0.06	0.08	0.10	0.14	0.98	0.97	0.84	1.44	0.95	1.07	0.87	0.84
S&P 500	23.17	20.97	22.00	18.54	1.01	1.07	1.02	1.08	0.97	1.03	0.95	1.07
USD / GBP FX Rate	16.17	14.84	15.05	15.13	1.01	1.02	1.00	1.04	0.97	0.99	0.97	0.96
5-Year Yield	0.30	0.51	0.77	1.06	1.02	0.98	1.42	1.09	0.81	0.89	0.76	0.60
10-Year Yield	0.30	0.51	0.71	0.75	0.97	0.97	1.42	1.40	0.96	0.97	0.88	0.82
Baa Spread	0.32	0.49	0.82	0.87	1.01	0.99	0.84	0.86	1.07	1.01	0.96	0.96

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2020:09.

Table S.7: Relative MAD of median forecasts (through 2017:12)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	2.27	2.21	2.03	2.06	1.01	1.02	1.18	1.04	1.01	1.12	1.08	0.95
Real Consumption	1.71	1.49	1.53	2.12	1.04	1.05	1.18	0.95	1.05	1.08	1.18	0.96
IP	4.16	4.19	4.20	5.07	0.90	1.03	1.08	0.87	1.09	1.07	1.19	1.12
Capacity Utilization	0.44	0.75	1.12	1.91	0.99	1.04	1.15	1.21	1.12	1.21	1.41	2.20
Unemployment	0.14	0.20	0.33	0.79	0.99	1.05	1.22	1.39	1.04	1.02	1.15	0.94
Nonfarm Payrolls	0.75	0.95	0.94	1.29	0.98	1.04	1.18	1.41	1.02	1.01	1.26	1.29
Hours	0.14	0.16	0.20	0.22	1.01	1.02	0.97	1.41	1.05	1.08	1.17	1.31
Hourly Earnings	1.46	1.35	1.44	1.91	1.01	1.01	0.75	0.84	0.99	1.00	1.09	0.98
PPI (Fin. Goods)	4.82	4.88	4.42	5.54	1.02	1.00	1.04	0.93	1.05	0.95	1.04	0.88
PPI (Metals)	21.81	25.35	20.14	17.98	1.00	0.97	1.01	0.95	1.03	0.85	0.95	0.99
PCE Prices	1.46	1.53	1.80	2.02	0.97	1.03	0.86	0.79	1.05	1.06	1.05	1.09
Federal Funds Rate	0.14	0.25	0.49	1.00	0.65	1.03	1.15	1.12	0.00	0.00	0.00	0.00
Housing Starts	0.06	0.08	0.11	0.14	1.08	0.96	0.89	1.41	1.00	1.09	0.83	0.80
S&P 500	21.77	20.48	22.11	18.18	1.04	1.02	0.99	1.04	1.00	0.96	0.94	1.03
USD / GBP FX Rate	14.42	14.28	13.64	15.00	0.95	0.99	1.03	1.05	1.00	0.96	0.99	0.95
5-Year Yield	0.28	0.47	0.72	1.00	1.04	0.96	1.69	1.12	0.84	0.87	0.73	0.63
10-Year Yield	0.27	0.51	0.66	0.73	0.95	0.93	1.53	1.39	0.83	0.96	0.82	0.80
Baa Spread	0.32	0.49	0.82	0.98	1.02	0.98	0.82	0.79	1.07	1.05	0.99	0.87

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2017:12.

Table S.8: Using 20-year yield: Relative RMSE of mean forecasts (through 2020:09)

Variable / Horizon	Relative to Standard ...																							
	Standard						Truncated						Shadow rate											
	3	6	12	24	3	6	3	6	12	24	3	6	3	6	12	24								
Real Income	15.69	15.58	15.84	16.97	1.00	1.00	1.00	1.01	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98**
Real Consumption	18.55	18.80	19.16	20.16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
IP	18.87	17.53	18.06	19.06	1.00	1.01	1.01	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.01**
Capacity Utilization	2.65	2.17	2.46	3.40	1.01	1.02	1.02	1.08	1.08	1.02	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.04	1.23***
Unemployment	1.55	1.65	1.68	1.92	1.00	1.00	1.00	1.01**	1.01**	1.07**	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01
Nonfarm Payrolls	16.57	16.03	16.42	17.24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hours	0.44	0.37	0.41	0.48	1.03	1.03	1.03**	1.16	1.16	1.43	1.06	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.08
Hourly Earnings	2.40	2.32	2.40	2.73	1.01	0.99	0.97	0.97	0.97	0.93**	0.99	1.01	1.01	1.00	1.00	1.00	1.01	1.00	1.00	1.00	1.00	1.00	1.02	0.96**
PPI (Fin. Goods)	8.70	8.44	8.63	8.93	1.01*	1.00	1.00	1.00	1.00	0.99	1.01	1.02*	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	0.99
PPI (Metals)	38.28	37.52	35.49	29.80	1.00	0.99	0.99	0.99	0.99	1.02	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.00
PCE Prices	2.49	2.38	2.77	3.32	0.97**	0.95*	0.91	0.91	0.91	0.78	1.04*	1.07*	1.04*	1.07*	1.07*	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.05
Federal Funds Rate	0.60	0.96	1.57	1.84	0.46*	0.49	0.60	0.60	0.60	1.11	0.36*	0.37	0.36*	0.37	0.37	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.58*
Housing Starts	0.11	0.13	0.20	0.37	1.03	0.99	0.99	0.98	0.98	1.07	1.04	1.08	1.04	1.08	1.08	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	0.96
S&P 500	45.68	42.40	42.01	41.61	1.00	1.02	1.02	1.03	1.03	1.04	0.98	0.98*	0.98	0.98*	0.98*	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
USD / GBP FX Rate	26.21	24.19	24.18	24.00	1.01	1.01	1.01	0.99	0.99	1.00	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.97**
5-Year Yield	0.51	0.74	1.01	1.28	1.01	1.05	1.05	1.34	1.34	2.10	0.94	0.95	0.94	0.95	0.95	0.82**	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
20-Year Yield	0.46	0.67	0.92	1.04	1.02*	1.08*	1.08*	1.40	1.40	2.44	0.97	0.97	0.97	0.97	0.97	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.79
Baa Spread	0.88	1.29	1.70	1.27	0.97	1.07	1.07	1.32	1.32	2.47	1.00	0.97	1.00	0.97	0.97	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.89

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2020:09. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags. Due to the close behavior of some of the models compared, and rounding of the reported values, one of the comparisons shows a significant relative RMSE of 1.00. This case arises from persistent differences in performance that are, however, too small to be relevant after rounding.

Table S.9: Using 20-year yield: Relative MAE of median forecasts (through 2020:09)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	5.77	5.56	5.63	5.97	1.01	1.00	1.02	0.97	1.00	0.99	1.00	1.00
Real Consumption	5.33	5.40	5.47	6.21	1.01	1.00	1.00	0.96	1.01	1.01	1.04*	1.01
IP	7.60	7.18	7.46	8.06	1.00	1.02	1.01	0.94	1.01	1.01	1.06**	1.11**
Capacity Utilization	0.96	1.23	1.70	2.60	1.01	1.03	1.11	0.98	1.02***	1.03	1.07	1.33**
Unemployment	0.46	0.54	0.68	1.10	1.00	1.00	1.07**	1.18***	1.01**	1.01	1.03	1.02
Nonfarm Payrolls	3.32	3.07	3.18	3.62	1.00	1.01**	1.02**	1.05***	1.00	1.01	1.03*	1.09*
Hours	0.22	0.23	0.27	0.32	1.01	1.04**	1.16	1.45*	1.03**	1.03	1.03	1.18**
Hourly Earnings	1.81	1.75	1.83	2.19	1.01	1.00	0.93	0.88*	1.00	1.03	1.02	0.97*
PPI (Fin. Goods)	6.57	6.34	6.44	6.80	1.01	1.00	1.00	0.98	1.01	1.00	1.01	1.00
PPI (Metals)	28.17	27.87	26.66	22.99	1.00	0.99	0.99	1.01	0.99	1.00	1.00	1.00
PCE Prices	1.86	1.83	2.21	2.69	0.98**	0.95**	0.89*	0.78*	1.03	1.05	1.05	1.03
Federal Funds Rate	0.30	0.55	1.00	1.39	0.51**	0.62	0.72	0.88	0.28***	0.32**	0.31**	0.34***
Housing Starts	0.08	0.10	0.15	0.26	1.02	0.98	0.95	1.07	1.04	1.04	0.99	0.87
S&P 500	31.38	29.11	28.59	26.94	1.00	1.03	1.03	1.06	0.97**	0.97**	0.98	0.99
USD / GBP FX Rate	19.55	18.34	18.44	18.16	1.01	1.01*	1.00	1.03	1.00	0.99	0.99	0.97
5-Year Yield	0.39	0.60	0.83	1.02	0.99	1.04	1.30	1.64	0.92	0.98	0.87	0.77
20-Year Yield	0.36	0.55	0.75	0.87	1.01	1.08*	1.32	1.86	0.99	0.98	0.93	0.84
Baa Spread	0.52	0.76	1.00	0.95	0.99	1.01	1.06	1.31	1.02	1.04	1.02	1.00

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2020:09. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags.

Table S.10: Using 20-year yield: Relative MAD of median forecasts (through 2020:09)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	2.54	2.54	2.20	2.14	0.99	0.98	1.09	0.98	0.95	0.99	1.09	1.03
Real Consumption	1.74	1.69	1.75	2.46	1.06	1.05	1.09	0.91	1.06	1.03	1.16	0.97
IP	4.20	4.49	4.55	5.74	0.96	1.01	1.06	0.85	1.09	0.98	1.14	1.05
Capacity Utilization	0.45	0.84	1.13	2.09	1.04	0.97	1.17	0.89	0.98	1.04	1.21	1.55
Unemployment	0.14	0.21	0.35	0.81	0.98	0.99	1.07	1.26	1.04	1.01	1.12	0.94
Nonfarm Payrolls	0.76	0.95	0.94	1.34	1.00	0.98	1.06	1.13	1.00	1.06	1.23	1.16
Hours	0.15	0.17	0.19	0.21	1.01	1.03	1.14	1.52	1.02	0.94	1.12	1.41
Hourly Earnings	1.47	1.32	1.43	1.83	1.07	1.04	0.89	0.85	1.03	1.08	1.02	0.95
PPI (Fin. Goods)	5.25	4.80	4.96	5.53	1.00	1.03	0.92	0.98	1.03	1.02	0.98	0.98
PPI (Metals)	20.21	21.72	19.48	18.44	1.01	0.92	1.01	1.00	0.97	0.97	0.96	0.96
PCE Prices	1.50	1.50	1.80	2.17	0.95	1.00	0.91	0.80	0.94	0.99	1.02	1.05
Federal Funds Rate	0.16	0.32	0.65	1.00	0.74	1.03	1.07	1.22	0.00	0.00	0.01	0.06
Housing Starts	0.06	0.08	0.10	0.16	1.03	0.98	0.85	1.31	1.06	1.08	0.96	0.97
S&P 500	23.15	20.93	21.95	19.05	1.01	1.08	0.99	1.05	0.98	1.00	1.00	1.02
USD / GBP FX Rate	16.36	14.73	14.66	15.60	1.00	1.02	1.06	1.03	1.00	0.98	1.02	0.97
5-Year Yield	0.32	0.53	0.75	0.99	0.99	0.96	1.31	1.13	0.76	0.87	0.82	0.64
20-Year Yield	0.30	0.48	0.68	0.79	0.99	1.04	1.23	1.41	0.94	1.00	0.94	0.83
Baa Spread	0.32	0.47	0.68	0.72	1.00	1.00	0.90	0.95	0.99	1.09	1.15	1.22

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2020:09.

Table S.11: Using 20-year yield: Relative CRPS of density forecasts (through 2020:09)

Variable / Horizon	Relative to Standard ...																	
	Standard						Truncated						Shadow rate					
	3	6	12	24	3	6	3	6	12	24	3	6	3	6	12	24		
Real Income	5.05	4.92	5.12	5.87	1.00	1.00	1.00	1.00	1.01	1.00	1.00	1.00	1.00	1.00	1.01*	1.02		
Real Consumption	5.07	4.90	5.02	5.79	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01**	1.02**	1.02		
IP	6.03	5.89	6.22	7.02	1.00	1.01	1.01	1.01	1.01	0.99	1.01	1.01	1.01	1.01	1.04***	1.06**		
Capacity Utilization	0.76	0.98	1.39	2.20	1.01	1.02	1.06	1.06	1.06	1.05**	1.01**	1.02	1.06**	1.06**	1.17***			
Unemployment	0.37	0.47	0.58	0.87	1.00	1.00	1.00	1.03**	1.03**	1.12***	1.01	1.01	1.01	1.01	1.01	1.02		
Nonfarm Payrolls	2.91	2.77	2.96	3.41	1.00	1.00*	1.01*	1.01*	1.01*	1.03***	1.00	1.00	1.01**	1.01**	1.04**			
Hours	0.17	0.18	0.21	0.29	1.01	1.03**	1.13*	1.13*	1.13*	1.24*	1.04**	1.03	1.04	1.04	1.13***			
Hourly Earnings	1.37	1.34	1.43	1.81	1.00	0.99	0.99	0.99	0.99	0.98**	1.00	1.01	1.01	1.01	1.01	1.01		
PPI (Fin. Goods)	4.87	4.72	4.79	5.27	1.01*	1.00	1.00	1.00	1.00	1.00	1.00	1.01	1.01	1.01	1.01	1.01		
PPI (Metals)	20.60	20.31	20.42	20.63	1.00	0.99	0.99	0.99	0.99	1.02	1.00	1.00	1.00	1.00	1.00	1.01*		
PCE Prices	1.35	1.36	1.55	1.97	0.98**	0.97**	0.94*	0.94*	0.94*	0.91*	1.03	1.04	1.05	1.05	1.03			
Federal Funds Rate	0.22	0.40	0.71	1.06	0.49**	0.57	0.66	0.66	0.66	0.78	0.30***	0.32**	0.31**	0.36***				
Housing Starts	0.06	0.07	0.11	0.19	1.00	1.00	1.00	1.00	1.01	1.10	1.02	1.02	0.99	0.99	0.91			
S&P 500	24.00	22.31	22.74	24.75	1.00	1.02	1.02	1.02	1.02	1.02	0.99	0.98**	1.00	1.00	1.02**			
USD / GBP FX Rate	14.65	13.89	14.15	15.53	1.01	1.01	1.01	1.00	1.00	1.02	1.00	0.99	1.00	1.00	1.00			
5-Year Yield	0.28	0.43	0.60	0.80	0.98	0.98	1.03	1.21	1.21	1.45	0.93	0.95	0.85*	0.73***				
20-Year Yield	0.26	0.39	0.54	0.65	1.01	1.06**	1.27*	1.27*	1.27*	1.68	0.99	0.98	0.94	0.88				
Baa Spread	0.36	0.54	0.72	0.83	0.99	1.02	1.10	1.10	1.10	1.21	1.02	1.02	0.98	0.98	1.03			

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2020:09. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags. Due to the close behavior of some of the models compared, and rounding of the reported values, one of the comparisons shows a significant relative CRPS of 1.00. This case arises from persistent differences in performance that are, however, too small to be relevant after rounding.

Table S.12: Using 20-year yield: Relative RMSE of mean forecasts (through 2017:12)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	8.07	7.70	7.82	8.27	1.00	1.00	1.01	1.03*	1.00	1.00	1.00	0.96**
Real Consumption	3.18	2.97	2.98	3.41	1.01	1.00	1.00	0.95	1.01	1.03*	1.07*	1.05
IP	5.99	6.31	6.10	6.82	1.01	1.06	1.04	0.90	1.02	1.01	1.09**	1.11**
Capacity Utilization	0.67	1.18	1.88	3.00	1.01	1.06	1.16	1.04	1.02*	1.01	1.10*	1.34***
Unemployment	0.22	0.28	0.45	0.89	1.00	1.00	1.12**	1.34***	1.02	1.04	1.07	1.15
Nonfarm Payrolls	1.25	1.32	1.23	1.45	0.99*	1.02*	1.17	1.15***	0.98*	0.97	1.04	1.25*
Hours	0.20	0.25	0.29	0.35	1.00	1.05*	1.34	1.78	1.03	1.04	1.04	1.21***
Hourly Earnings	2.27	2.31	2.36	2.69	1.00	0.98	0.96	0.92**	0.99	1.02	1.00	0.96***
PPI (Fin. Goods)	7.87	7.66	7.78	7.88	1.01*	1.00	0.99	0.99	1.02	1.02	1.03	0.99
PPI (Metals)	40.09	39.80	37.09	29.38	1.00	0.99	0.99	1.02	1.01	1.01	1.01	1.00
PCE Prices	2.34	2.41	2.78	3.26	0.97*	0.94*	0.89*	0.76	1.07**	1.08**	1.11	1.06
Federal Funds Rate	0.49	1.02	1.66	1.90	0.39	0.42	0.57	1.10	0.25	0.22	0.27	0.55*
Housing Starts	0.09	0.12	0.21	0.38	0.99	0.99	0.97	1.07	1.06	1.11	1.08	0.96
S&P 500	38.82	34.85	35.14	32.94	1.01	1.04	1.05	1.08	0.97**	0.97**	0.98	0.99
USD / GBP FX Rate	26.77	24.65	24.43	23.67	1.01	1.01	0.99	1.01	0.99	0.98	0.99	0.97**
5-Year Yield	0.45	0.71	0.99	1.28	1.01	1.05	1.41	2.15	0.98	0.91	0.74**	0.75
20-Year Yield	0.45	0.67	0.91	1.04	1.02*	1.10*	1.47	2.51	0.98	0.94	0.86	0.74*
Baa Spread	0.74	1.39	1.83	1.31	1.02	1.09	1.32	2.50	0.99	0.97	0.90	0.89

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2017:12. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags.

Table S.13: Using 20-year yield: Relative MAE of median forecasts (through 2017:12)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	3.94	3.71	3.67	3.67	1.01	1.01	1.04	0.96	1.00	0.99	1.00	1.00
Real Consumption	2.36	2.17	2.22	2.67	1.00	1.01	1.01	0.90	1.01	1.02	1.13**	1.02
IP	4.78	4.99	4.94	5.35	0.99	1.05	1.02	0.90	1.03	1.02	1.12***	1.18**
Capacity Utilization	0.54	0.94	1.51	2.38	1.01	1.04	1.15	0.99	1.03**	1.03	1.08	1.42***
Unemployment	0.17	0.23	0.37	0.78	1.00	1.00	1.15***	1.29***	1.02*	1.04	1.06	1.05
Nonfarm Payrolls	0.94	1.00	0.98	1.23	0.99	1.02**	1.09**	1.14***	0.98	1.01	1.11	1.25
Hours	0.16	0.20	0.23	0.27	1.00	1.05**	1.22	1.60*	1.04**	1.04	1.07	1.25***
Hourly Earnings	1.75	1.74	1.79	2.16	1.01	0.99	0.92	0.87*	1.00	1.03	1.02	0.96*
PPI (Fin. Goods)	6.20	6.06	6.08	6.30	1.01*	1.00	1.00	0.98	1.02	1.01	1.02	1.00
PPI (Metals)	29.77	29.77	27.82	22.44	1.00	0.99	0.99	1.01	1.00	1.00	1.01	1.00
PCE Prices	1.87	1.91	2.22	2.62	0.98**	0.94**	0.87**	0.76*	1.04	1.07*	1.08	1.05
Federal Funds Rate	0.27	0.56	1.04	1.45	0.46*	0.56	0.68	0.87	0.18***	0.17**	0.21**	0.30***
Housing Starts	0.07	0.10	0.16	0.27	1.01	0.97	0.94	1.08	1.06	1.05	0.98	0.86
S&P 500	28.43	26.27	26.52	24.20	1.01	1.04	1.03	1.07	0.96***	0.96**	0.98	0.99
USD / GBP FX Rate	19.32	18.08	18.22	17.87	1.01	1.01	1.00	1.03	1.00	0.99	0.98	0.97*
5-Year Yield	0.35	0.57	0.80	1.01	1.02	1.04	1.36	1.69	0.97	0.97	0.82	0.74
20-Year Yield	0.35	0.54	0.74	0.87	1.02*	1.10*	1.39	1.93	1.00	0.97	0.89	0.81
Baa Spread	0.47	0.80	1.07	0.99	1.01	1.02	1.07	1.32	1.02	1.04	1.02	1.00

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2017:12. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags.

Table S.14: Using 20-year yield: Relative MAD of median forecasts (through 2017:12)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	2.28	2.21	2.01	1.96	1.01	1.06	1.03	1.05	0.92	1.10	1.05	1.04
Real Consumption	1.72	1.48	1.57	2.21	0.99	1.08	1.08	0.97	1.02	0.99	1.25	1.04
IP	4.02	4.44	4.41	4.94	0.93	1.01	1.02	0.90	1.13	0.95	1.15	1.17
Capacity Utilization	0.44	0.76	1.12	1.90	1.02	1.01	1.20	0.95	0.98	1.03	1.18	1.74
Unemployment	0.14	0.20	0.32	0.79	1.01	1.02	1.16	1.28	1.03	1.05	1.17	0.93
Nonfarm Payrolls	0.75	0.85	0.91	1.24	0.95	1.00	1.05	1.17	0.95	1.10	1.15	1.20
Hours	0.13	0.16	0.19	0.20	1.04	1.10	1.11	1.52	1.11	1.00	1.18	1.38
Hourly Earnings	1.45	1.34	1.45	1.85	1.11	1.08	0.89	0.84	1.04	1.07	1.03	0.94
PPI (Fin. Goods)	5.20	4.76	4.81	5.47	0.98	1.03	0.95	0.97	0.99	1.03	1.01	0.97
PPI (Metals)	22.00	23.94	20.48	17.69	0.98	1.05	0.98	1.02	0.94	0.92	0.91	0.97
PCE Prices	1.57	1.56	1.86	1.98	0.99	1.02	0.90	0.81	0.97	1.02	1.08	1.14
Federal Funds Rate	0.15	0.32	0.60	1.11	0.73	1.03	1.11	1.15	0.00	0.00	0.00	0.00
Housing Starts	0.06	0.08	0.10	0.16	1.06	0.92	0.85	1.26	1.06	1.11	0.94	0.94
S&P 500	21.55	20.07	21.62	17.83	1.03	1.02	0.96	1.10	1.01	0.98	1.00	1.02
USD / GBP FX Rate	15.10	13.91	14.50	15.59	0.97	1.04	0.97	1.03	0.95	1.02	0.94	0.95
5-Year Yield	0.29	0.50	0.70	0.96	1.02	0.89	1.40	1.07	0.83	0.89	0.81	0.63
20-Year Yield	0.27	0.47	0.62	0.78	1.03	1.04	1.30	1.42	1.02	0.98	0.93	0.80
Baa Spread	0.33	0.45	0.66	0.76	1.00	1.00	0.90	0.94	0.98	1.13	1.19	1.19

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2017:12.

Table S.15: Using 20-year yield: Relative CRPS of density forecasts (through 2017:12)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	3.29	3.23	3.42	3.85	1.00	1.00	1.02	1.01	1.00	1.00	1.02**	1.03*
Real Consumption	1.83	1.80	1.96	2.50	1.00	1.00	1.01	0.99	1.01	1.02**	1.06***	1.05
IP	3.48	3.75	3.89	4.65	1.00	1.02	1.01	0.98	1.02	1.02	1.08***	1.11***
Capacity Utilization	0.41	0.72	1.23	2.09	1.01	1.03	1.08	1.07**	1.03***	1.03	1.09***	1.22***
Unemployment	0.12	0.17	0.29	0.57	1.00	1.01	1.08***	1.21***	1.01	1.02	1.04	1.06
Nonfarm Payrolls	0.69	0.76	0.84	1.15	0.99	1.01*	1.06*	1.09***	0.98*	1.00	1.04	1.11**
Hours	0.12	0.15	0.18	0.25	1.00	1.04**	1.17*	1.31*	1.04**	1.05**	1.07**	1.18***
Hourly Earnings	1.30	1.33	1.41	1.79	1.00	0.99	0.98	0.97**	1.00	1.01	1.00	1.01
PPI (Fin. Goods)	4.42	4.42	4.52	4.91	1.01*	1.00	1.00	1.00	1.01	1.01	1.02	1.01
PPI (Metals)	21.74	21.71	21.36	20.59	1.00	1.00	0.99	1.02	1.00	1.00	1.00	1.02*
PCE Prices	1.32	1.40	1.56	1.94	0.98**	0.96**	0.93*	0.90*	1.05*	1.06*	1.07	1.04
Federal Funds Rate	0.19	0.40	0.74	1.10	0.43**	0.51	0.62	0.77	0.18***	0.17**	0.21**	0.33***
Housing Starts	0.06	0.07	0.12	0.20	1.00	1.00	1.01	1.11	1.02	1.03	0.98	0.90
S&P 500	20.98	20.12	21.35	22.95	1.00	1.02	1.02	1.03	0.97**	0.98**	0.99	1.02***
USD / GBP FX Rate	14.65	14.09	14.26	15.43	1.01	1.01	1.00	1.02	0.99	0.99	0.99	1.00
5-Year Yield	0.26	0.41	0.58	0.80	1.01	1.04	1.26	1.47	0.97	0.92	0.79**	0.70***
20-Year Yield	0.25	0.39	0.53	0.66	1.02	1.08**	1.32*	1.72	0.99	0.95	0.90	0.86*
Baa Spread	0.33	0.57	0.77	0.85	1.01	1.03	1.11	1.22	1.02	1.01	0.97	1.04

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2017:12. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags.

Table S.16: Using 3-month Tbill: Relative RMSE of mean forecasts (through 2020:09)

Variable / Horizon	Relative to Standard ...																						
	Standard						Truncated						Shadow rate										
	3	6	12	24	3	6	3	6	12	24	3	6	3	6	12	24							
Real Income	15.77	15.59	15.84	17.10	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98*
Real Consumption	18.54	18.79	19.16	20.19	1.00	1.00	1.00	1.00	1.00	0.99*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
IP	18.94	17.54	18.00	19.14	0.99	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01*
Capacity Utilization	2.85	2.22	2.67	3.94	0.97	0.99	0.99	0.99	1.00	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.15***
Unemployment	1.56	1.65	1.67	1.80	1.00	1.00	1.00	1.00	1.01	1.02*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01
Nonfarm Payrolls	16.62	16.02	16.40	17.22	1.00	1.00*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hours	0.47	0.37	0.41	0.47	0.98	1.00	1.00	1.00	1.01	1.04	1.02	0.99	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.02
Hourly Earnings	2.42	2.37	2.47	2.75	1.01	1.00	1.00	0.97	0.94*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99
PPI (Fin. Goods)	8.53	8.38	8.66	8.90	1.00	1.00	0.99	0.96	0.97	0.97	1.02*	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	0.99
PPI (Metals)	38.52	37.74	35.58	29.85	1.01	1.00	1.00	0.99	1.01**	1.00	1.01	1.00	1.01	1.00	1.00	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PCE Prices	2.39	2.37	2.79	3.45	1.02	0.97**	0.92	0.92	0.89	0.89	1.04**	1.05	1.06	1.02	1.02	1.05	1.06	1.06	1.02	1.02	1.06	1.02	1.02
3m Treasury Bill	0.48	0.82	1.31	1.68	0.65*	0.52	0.57	0.57	0.81	0.81	0.53**	0.44	0.45	0.45	0.61*	0.44	0.45	0.45	0.61*	0.45	0.45	0.45	0.61*
Housing Starts	0.12	0.13	0.19	0.32	1.01	1.00	0.99	0.92	0.89	0.89	1.02	1.04	1.07	1.04	1.04	1.04	1.07	1.07	1.04	1.04	1.07	1.04	1.04
S&P 500	44.51	41.88	42.32	41.46	0.98	1.00	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99
USD / GBP FX Rate	26.09	23.91	23.99	23.50	1.00	1.00	1.00	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.98**
5-Year Yield	0.51	0.72	1.01	1.33	0.95	0.97	1.00	1.00	1.00	1.17	0.91	0.93*	0.83**	0.72**	0.93*	0.83**	0.83**	0.72**	0.93*	0.83**	0.83**	0.72**	
10-Year Yield	0.48	0.70	0.96	1.18	1.03	0.99	0.99	0.99	1.02	1.18	1.00	0.98	0.90	0.71**	0.98	0.90	0.90	0.71**	0.98	0.90	0.90	0.71**	
Baa Spread	0.82	1.05	1.44	1.33	0.87	0.78	0.64	0.64	0.67*	0.67*	1.05*	1.09	1.02	1.02	1.09	1.02	1.02	1.02	1.09	1.02	1.02	0.92	

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2020:09. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags. Due to the close behavior of some of the models compared, and rounding of the reported values, one of the comparisons shows a significant relative RMSE of 1.00. This case arises from persistent differences in performance that are, however, too small to be relevant after rounding.

Table S.17: Using 3-month Tbill: Relative MAE of median forecasts (through 2020:09)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	5.80	5.59	5.64	5.96	0.99	1.00	1.00	0.98	1.00	1.00	1.00	1.00
Real Consumption	5.35	5.44	5.52	6.25	1.01	1.00	0.99	0.95	1.01*	1.01	1.03*	1.02
IP	7.69	7.28	7.61	8.41	1.00	1.00	1.00	0.93*	1.00	0.99*	1.02	1.08*
Capacity Utilization	1.04	1.36	1.99	3.18	0.99	0.99	0.99	0.96	1.02***	1.02**	1.04*	1.19***
Unemployment	0.47	0.58	0.75	1.05	1.00	1.00	1.02	1.05**	0.99*	1.00	1.01	1.02
Nonfarm Payrolls	3.41	3.18	3.34	3.67	0.99**	0.99	1.00	0.99	1.00	1.00	1.02**	1.09***
Hours	0.23	0.24	0.28	0.33	1.00	1.01	1.01	1.04	1.01*	0.99	0.99	1.06***
Hourly Earnings	1.81	1.77	1.87	2.22	1.00	1.00	0.96	0.93*	1.00	1.01	1.01	0.98
PPI (Fin. Goods)	6.38	6.23	6.38	6.73	1.00	0.99	0.96	0.97	1.02	1.01	1.01	0.99
PPI (Metals)	28.15	27.87	26.64	23.22	1.00	1.00	0.98	1.00	0.99	1.01	1.00	0.99
PCE Prices	1.78	1.81	2.17	2.77	1.01	0.96***	0.91*	0.91	1.03*	1.04	1.04	1.03
3m Treasury Bill	0.28	0.50	0.83	1.24	0.49**	0.54	0.60	0.66	0.30***	0.32**	0.36**	0.41**
Housing Starts	0.08	0.10	0.14	0.22	1.01	1.00	0.96	0.99	1.02	1.01	1.00	0.93
S&P 500	30.87	28.64	28.85	26.94	0.98*	0.99	0.99	1.00	1.00	0.99	0.98*	0.99
USD / GBP FX Rate	19.36	18.11	18.10	17.53	1.00	1.01	1.01	1.02	1.00	0.99	0.99*	0.99
5-Year Yield	0.37	0.58	0.82	1.08	0.96	0.98	0.98	1.01	0.92	0.96	0.93	0.84*
10-Year Yield	0.36	0.56	0.80	0.94	1.00	1.00	1.02	1.07	0.98	1.00	0.95	0.95
Baa Spread	0.49	0.70	1.01	1.04	0.91**	0.85*	0.73	0.74	1.04	1.05	1.01	0.97

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2020:09. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags.

Table S.18: Using 3-month Tbill: Relative MAD of median forecasts (through 2020:09)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	2.50	2.46	2.37	2.14	1.00	1.01	0.98	0.99	0.97	1.02	1.02	1.00
Real Consumption	1.87	1.71	1.89	2.36	1.05	1.02	0.92	0.87	1.03	0.98	1.02	1.07
IP	4.52	4.25	4.77	5.78	1.04	1.01	1.03	0.93	1.02	1.07	1.09	1.05
Capacity Utilization	0.50	0.95	1.63	3.14	0.99	0.94	0.91	0.85	1.06	1.01	1.01	1.31
Unemployment	0.16	0.26	0.44	0.77	0.99	0.99	1.02	1.05	0.97	1.00	1.06	0.93
Nonfarm Payrolls	0.78	1.12	1.11	1.27	0.98	0.93	1.03	1.06	1.06	1.00	1.09	1.31
Hours	0.15	0.17	0.22	0.25	0.99	1.02	1.05	1.22	1.03	0.99	0.94	1.11
Hourly Earnings	1.53	1.41	1.43	2.04	0.99	0.99	0.92	0.94	1.02	0.98	1.02	0.91
PPI (Fin. Goods)	5.00	4.89	4.51	5.26	0.99	1.05	1.03	0.99	0.97	0.97	1.05	0.94
PPI (Metals)	19.42	21.24	18.90	18.56	0.99	1.01	1.03	1.05	1.02	1.01	1.02	1.00
PCE Prices	1.32	1.39	1.75	2.24	0.99	0.96	0.93	0.92	1.04	1.05	1.04	1.07
3m Treasury Bill	0.17	0.26	0.42	0.92	0.48	0.81	0.87	0.83	0.00	0.00	0.00	0.01
Housing Starts	0.06	0.08	0.10	0.14	1.01	1.04	1.08	1.16	1.14	0.96	1.00	0.77
S&P 500	22.25	20.72	21.93	19.61	1.00	1.03	1.01	0.98	1.00	0.98	1.01	0.97
USD / GBP FX Rate	14.92	14.08	14.08	14.42	1.00	1.07	1.03	1.05	1.03	0.97	0.99	1.02
5-Year Yield	0.27	0.47	0.74	0.95	0.95	0.98	0.96	1.02	0.87	0.89	0.87	0.78
10-Year Yield	0.31	0.47	0.69	0.81	0.96	1.05	0.97	1.04	0.88	0.96	1.07	1.01
Baa Spread	0.36	0.49	0.76	0.75	0.93	0.95	0.84	0.94	0.95	1.01	1.00	1.25

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2020:09.

Table S.19: Using 3-month Tbill: Relative CRPS of density forecasts (through 2020:09)

Variable / Horizon	Relative to Standard ...																	
	Standard						Truncated						Shadow rate					
	3	6	12	24	3	6	3	6	12	24	3	6	3	6	12	24		
Real Income	5.10	4.94	5.13	5.91	0.99	1.00**	1.00	0.99	1.00	0.99	1.00	1.01*	1.00	1.00	1.01*	1.02**		
Real Consumption	5.09	4.92	5.04	5.81	1.00	1.00	1.00	0.99	1.00	0.99	1.00	1.01***	1.00	1.01***	1.02***	1.02		
IP	6.11	5.95	6.29	7.14	0.99	1.00	1.00	0.99 *	1.00	0.97 *	1.00	1.00	1.00	1.00	1.02**	1.05**		
Capacity Utilization	0.81	1.05	1.55	2.48	0.99	0.99	1.00	0.99	1.00	1.00	1.01**	1.02*	1.04**	1.04**	1.13***	1.13***		
Unemployment	0.38	0.48	0.62	0.85	1.00	1.00	1.00	1.00	1.02	1.03**	0.99	0.99	1.00	1.00	1.00	1.02		
Nonfarm Payrolls	2.96	2.83	3.04	3.46	0.99 *	0.99	1.00	0.99	1.00	1.00	1.00	1.00	1.01**	1.01**	1.04***	1.04***		
Hours	0.17	0.18	0.22	0.28	0.99	1.01	1.01*	0.99	1.01*	1.03*	1.02***	1.00	1.02	1.02	1.09***	1.09***		
Hourly Earnings	1.37	1.35	1.45	1.82	1.00	1.00	1.00	0.98	1.00	0.97 **	1.00	1.00	1.00	1.00	1.01	1.02***		
PPI (Fin. Goods)	4.78	4.66	4.78	5.23	1.00	0.99	0.98	0.99	0.98	0.99	1.01	1.01	1.01	1.01	1.01	1.01		
PPI (Metals)	20.66	20.30	20.41	20.58	1.00	1.00	1.00	0.99	1.01**	1.01**	1.00	1.01	1.00	1.00	1.01***	1.01***		
PCE Prices	1.31	1.35	1.54	1.99	1.00	0.98 ***	0.95 *	0.95	1.03	1.03	1.03	1.04	1.04	1.03	1.04	1.03		
3m Treasury Bill	0.20	0.35	0.60	0.94	0.51 ***	0.54 *	0.58	0.60 **	0.34 ***	0.36 ***	0.38 **	0.41 ***	0.41 ***	0.41 ***	0.41 ***	0.41 ***		
Housing Starts	0.06	0.07	0.11	0.17	1.00	1.00	1.00	0.97	1.01	1.01	1.00	1.00	1.00	1.00	1.00	1.02**		
S&P 500	23.60	22.08	22.85	24.76	0.99 *	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.02**		
USD / GBP FX Rate	14.62	13.81	14.03	15.28	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01		
5-Year Yield	0.27	0.41	0.59	0.81	0.96	0.98	0.97	0.97	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
10-Year Yield	0.27	0.41	0.57	0.72	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Baa Spread	0.34	0.48	0.68	0.85	0.92 **	0.86	0.78	0.80 **	1.05	1.05	1.06	1.02	1.02	1.02	1.02	1.02		

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2020:09. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags. Due to the close behavior of some of the models compared, and rounding of the reported values, one of the comparisons shows a significant relative CRPS of 1.00. This case arises from persistent differences in performance that are, however, too small to be relevant after rounding.

Table S.20: Using 3-month Tbill: Relative RMSE of mean forecasts (through 2017:12)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	8.05	7.72	7.83	8.78	1.00	1.00	1.00	0.99	1.00	1.00	1.00	0.90*
Real Consumption	3.16	3.02	2.99	3.53	1.00	1.00	0.98	0.88	1.01	1.02**	1.06*	1.05
IP	6.07	6.35	6.27	7.23	1.01	0.99	1.01	0.90	1.00	1.00	1.03	1.06
Capacity Utilization	0.72	1.30	2.27	3.85	1.00	0.98	0.99	0.97	1.03***	1.02*	1.04	1.17***
Unemployment	0.24	0.32	0.52	0.90	1.01	1.04	1.11	1.10	0.99	0.98	1.00	1.08
Nonfarm Payrolls	1.28	1.38	1.32	1.52	0.96*	0.94	0.98	0.99	1.01	1.01	1.03	1.24**
Hours	0.21	0.27	0.32	0.38	1.00	1.01	1.02*	1.06	1.01	1.00	0.99	1.06***
Hourly Earnings	2.29	2.37	2.43	2.71	1.00	1.00	0.97	0.93*	1.00	1.00	0.99	0.98
PPI (Fin. Goods)	7.67	7.57	7.82	7.85	1.00	0.98	0.95	0.96	1.02*	1.03	1.02	0.99
PPI (Metals)	40.62	40.03	37.22	29.56	1.00	1.00	0.98	1.01**	1.00	1.01	1.00	0.99
PCE Prices	2.30	2.41	2.83	3.43	1.00**	0.97**	0.90	0.88	1.04*	1.06	1.07	1.03
3m Treasury Bill	0.43	0.84	1.36	1.72	0.39	0.41	0.51	0.80	0.24*	0.24	0.34	0.58*
Housing Starts	0.10	0.12	0.20	0.33	1.00	0.98	0.91	0.89	1.03	1.06	1.08	1.04
S&P 500	37.11	34.12	35.43	32.71	0.99	0.99	0.99	1.00	1.01	1.00	0.98*	0.99
USD / GBP FX Rate	26.45	24.27	24.21	23.14	1.00	1.00	0.99	0.99	0.99	1.00	1.00	0.99*
5-Year Yield	0.44	0.68	0.94	1.30	0.98	0.95	1.00	1.18	0.94	0.87***	0.72***	0.65***
10-Year Yield	0.45	0.67	0.89	1.14	1.00	0.99	1.02	1.21	0.98	0.94	0.83*	0.61***
Baa Spread	0.59	1.10	1.52	1.36	0.90	0.77	0.61	0.67*	1.10	1.10	1.02	0.92

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2017:12. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags. Due to the close behavior of some of the models compared, and rounding of the reported values, one of the comparisons shows a significant relative RMSE of 1.00. This case arises from persistent differences in performance that are, however, too small to be relevant after rounding.

Table S.21: Using 3-month Tbill: Relative MAE of median forecasts (through 2017:12)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	3.98	3.77	3.70	3.67	1.00**	1.00	1.00	0.96	1.00	0.99	0.99	1.00
Real Consumption	2.36	2.20	2.28	2.70	1.00	1.00	0.96	0.87	1.01	1.02	1.09**	1.05
IP	4.87	5.04	5.16	5.71	1.01*	1.00	1.01	0.88*	0.99	0.99*	1.03*	1.12*
Capacity Utilization	0.58	1.03	1.77	3.13	1.00	0.98	0.99	0.96	1.03***	1.03*	1.04*	1.21***
Unemployment	0.19	0.27	0.43	0.76	1.00	1.01	1.05	1.07**	0.98	0.99	1.02	1.03
Nonfarm Payrolls	0.98	1.08	1.09	1.26	0.96*	0.97	1.01	0.97	1.00	1.01	1.06*	1.28***
Hours	0.17	0.21	0.26	0.29	1.00	1.01	1.02	1.05	1.02	0.99	0.98	1.09***
Hourly Earnings	1.74	1.77	1.85	2.18	1.00	1.00	0.95	0.93*	1.00	1.01	1.01	0.98
PPI (Fin. Goods)	6.00	5.94	6.06	6.26	1.00	0.99	0.95	0.97	1.02	1.01	1.02	0.99
PPI (Metals)	30.02	29.77	27.88	22.71	1.00	1.00	0.98	1.01	0.99	1.01**	1.00	0.99
PCE Prices	1.81	1.91	2.25	2.73	1.00*	0.96***	0.90*	0.90	1.03	1.04	1.05	1.03
3m Treasury Bill	0.25	0.49	0.84	1.26	0.36**	0.44	0.53	0.64	0.14***	0.15**	0.25**	0.38**
Housing Starts	0.07	0.10	0.15	0.22	1.00	0.99	0.95	0.99	1.03	1.02	1.00	0.92
S&P 500	27.64	25.66	26.74	24.20	0.99	0.98	0.98	1.00	1.01	0.99	0.98**	0.99
USD / GBP FX Rate	19.00	17.82	17.79	17.21	1.00*	1.01	1.01	1.02	1.00	0.99	0.99**	0.99
5-Year Yield	0.33	0.54	0.76	1.04	0.99	0.96	0.98	1.00	0.96	0.94	0.89	0.81*
10-Year Yield	0.34	0.54	0.75	0.89	1.00	0.99	1.02	1.08	0.99	0.98	0.92	0.93
Baa Spread	0.42	0.73	1.04	1.08	0.91**	0.83*	0.70	0.73	1.06	1.06	1.02	0.97

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2017:12. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags. Due to the close behavior of some of the models compared, and rounding of the reported values, a few comparisons show a significant relative MAE of 1.00. These cases arise from persistent differences in performance that are, however, too small to be relevant after rounding.

Table S.22: Using 3-month Tbill: Relative MAD of median forecasts (through 2017:12)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	2.34	2.41	2.10	1.97	1.01	1.02	0.98	1.01	0.96	1.02	1.05	1.04
Real Consumption	1.78	1.52	1.74	2.24	1.00	0.99	0.96	0.87	1.04	0.95	1.07	1.03
IP	4.47	4.43	4.62	5.45	1.03	1.01	1.06	0.96	1.00	1.04	1.08	1.06
Capacity Utilization	0.49	0.83	1.32	3.07	0.92	0.97	1.02	0.86	1.00	1.03	1.09	1.35
Unemployment	0.16	0.25	0.42	0.68	0.96	0.96	0.99	1.09	1.02	1.00	1.03	1.02
Nonfarm Payrolls	0.75	1.04	1.03	1.20	0.98	0.88	1.07	0.98	1.00	0.98	1.02	1.30
Hours	0.15	0.17	0.23	0.24	0.98	1.05	1.04	1.21	1.04	1.01	0.96	1.10
Hourly Earnings	1.49	1.41	1.44	2.04	0.99	1.00	0.91	0.94	1.01	1.00	1.04	0.92
PPI (Fin. Goods)	4.73	4.93	4.49	5.21	0.99	1.05	1.04	0.99	1.03	0.97	1.06	0.94
PPI (Metals)	20.51	24.31	19.04	17.44	1.01	0.98	1.03	1.05	1.05	0.95	1.02	1.04
PCE Prices	1.43	1.51	1.82	2.19	1.03	0.99	0.91	0.94	1.06	1.08	1.03	1.09
3m Treasury Bill	0.14	0.26	0.42	0.91	0.49	0.78	0.84	0.80	0.00	0.00	0.00	0.00
Housing Starts	0.06	0.09	0.10	0.13	1.01	1.03	1.09	1.18	1.07	0.94	1.00	0.77
S&P 500	21.61	20.03	21.22	17.85	0.99	0.99	0.98	0.99	0.97	0.94	0.95	1.00
USD / GBP FX Rate	12.55	13.56	13.00	14.29	1.06	0.99	1.04	1.05	1.12	0.96	0.96	1.02
5-Year Yield	0.25	0.44	0.72	0.87	0.98	0.94	0.85	1.01	0.84	0.88	0.86	0.78
10-Year Yield	0.27	0.43	0.66	0.70	1.03	1.04	0.99	1.11	0.98	1.01	1.00	1.07
Baa Spread	0.37	0.49	0.73	0.91	0.91	0.95	0.82	0.80	0.92	1.01	1.02	1.07

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2017:12.

Table S.23: Using 3-month Tbill: Relative CRPS of density forecasts (through 2017:12)

Variable / Horizon	Relative to Standard ...																	
	Standard						Truncated						Shadow rate					
	3	6	12	24	3	6	3	6	12	24	3	6	3	6	12	24		
Real Income	3.31	3.26	3.45	3.91	1.00	1.00	1.00	1.00	1.00	0.99*	1.00	1.00	1.00	1.00	1.01	1.04***		
Real Consumption	1.82	1.81	1.97	2.52	1.00	1.00	1.00	1.00	0.99	0.97	1.02***	1.02***	1.05***	1.07***	1.07***	1.07***		
IP	3.54	3.79	3.99	4.79	1.01*	1.00	1.00	1.00	1.00	0.96*	1.00	1.00	1.03**	1.08**	1.08**	1.08**		
Capacity Utilization	0.44	0.78	1.41	2.46	1.00	0.99	1.00	1.00	1.00	1.00	1.03***	1.03**	1.04**	1.14***	1.14***	1.14***		
Unemployment	0.13	0.19	0.32	0.58	1.00	1.01	1.04	1.04**	1.04	1.04**	0.99	0.98	1.00	1.04	1.00	1.04		
Nonfarm Payrolls	0.72	0.80	0.89	1.18	0.97*	0.97	0.99	1.01	0.99	1.01	1.00	1.01	1.03*	1.13***	1.13***	1.13***		
Hours	0.12	0.16	0.20	0.26	1.00	1.01	1.01**	1.04*	1.01**	1.04*	1.02***	1.01	1.02	1.11***	1.11***	1.11***		
Hourly Earnings	1.31	1.35	1.43	1.80	1.00	1.00	1.00	0.98	0.98	0.97**	1.00	1.00	1.00	1.02***	1.02***	1.02***		
PPI (Fin. Goods)	4.32	4.36	4.51	4.86	1.00	0.99	0.97	0.98	0.97	0.98	1.02	1.02	1.02	1.01	1.01	1.01		
PPI (Metals)	21.88	21.68	21.37	20.57	1.00	1.00	1.00	0.99	0.99	1.01**	1.00	1.01**	1.00	1.01***	1.01***	1.01***		
PCE Prices	1.29	1.39	1.58	1.98	1.00**	0.97***	0.94*	0.94	0.94	0.94	1.04	1.04	1.05	1.04	1.04	1.04		
3m Treasury Bill	0.18	0.34	0.61	0.96	0.37***	0.43*	0.51	0.58**	0.15***	0.17***	0.27**	0.39***	0.39***	0.39***	0.39***	0.39***		
Housing Starts	0.06	0.07	0.11	0.18	1.00	1.00	1.00	0.97	0.97	0.98	1.01	1.00	0.99	0.96	0.96	0.96		
S&P 500	20.45	19.82	21.43	22.96	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.03***	1.03***	1.03***		
USD / GBP FX Rate	14.53	13.98	14.10	15.19	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	1.00	1.02	1.02	1.02		
5-Year Yield	0.24	0.38	0.55	0.79	0.99	0.97	0.96	0.96	0.96	0.93	0.96	0.92*	0.83***	0.73***	0.73***	0.73***		
10-Year Yield	0.25	0.38	0.53	0.69	1.00	0.99	1.01	1.00	0.99	1.00	0.98	0.96	0.91	0.87*	0.87*	0.87*		
Baa Spread	0.29	0.50	0.71	0.88	0.93*	0.85	0.75	0.75	0.80**	1.06	1.07	1.02	1.02	1.02	1.02	1.02		

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2017:12. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags. Due to the close behavior of some of the models compared, and rounding of the reported values, one of the comparisons shows a significant relative CRPS of 1.00. This case arises from persistent differences in performance that are, however, too small to be relevant after rounding.

Table S.24: ELB set to 12.5bp: Relative RMSE of mean forecasts (through 2020:09)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	15.68	15.57	15.86	16.83	1.00	1.00	1.01	1.01	1.01	1.00*	1.00	0.99**
Real Consumption	18.58	18.81	19.13	20.13	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
IP	18.95	17.51	17.99	19.08	0.99	1.01	1.01	1.00	1.00	1.00	1.00**	1.00
Capacity Utilization	2.78	2.22	2.58	3.66	1.00	1.03	1.15	1.27	1.00	0.99	1.01	1.09***
Unemployment	1.56	1.65	1.68	1.90	1.00	1.00	1.01**	1.09**	1.00	1.00	1.00	0.99
Nonfarm Payrolls	16.62	16.03	16.42	17.24	1.00	1.00*	1.00	1.00**	1.00	1.00	1.00	1.00
Hours	0.45	0.37	0.40	0.48	1.02	1.02**	1.12	1.34	1.03	0.99	0.99	1.02
Hourly Earnings	2.45	2.35	2.45	2.81	1.00	0.98	0.97	0.91***	0.99	1.00	1.00	0.97**
PPI (Fin. Goods)	8.54	8.30	8.49	8.82	1.01	0.99	0.97	0.93	1.00	1.00	0.99	0.99
PPI (Metals)	38.34	37.54	35.43	29.93	1.00	0.99	0.99	1.00	1.00	1.00	1.01	1.00
PCE Prices	2.40	2.30	2.65	3.23	0.99	0.95	0.91	0.77	1.02	1.00	1.00	0.98
Federal Funds Rate	0.59	0.92	1.50	1.82	0.48*	0.49	0.58	1.02	0.39*	0.42	0.46	0.78
Housing Starts	0.11	0.13	0.20	0.35	1.03	0.98	0.96	1.05	1.01	1.00	1.00	1.01
S&P 500	45.71	42.47	42.20	41.46	1.00	1.02	1.02	1.03	1.00	1.00	1.00	1.00
USD / GBP FX Rate	26.20	24.13	24.07	23.93	1.01	1.00	0.99	1.00	1.00	1.00	1.00	0.99**
5-Year Yield	0.52	0.76	1.04	1.32	0.99	1.03	1.26	1.89	0.95	0.99	0.98	1.03
10-Year Yield	0.48	0.73	1.00	1.14	1.03	1.05**	1.31	2.23	1.01	1.00	1.00	1.03
Baa Spread	0.87	1.27	1.71	1.40	0.96	1.04	1.24	2.25	1.05	1.09	1.07	0.88***

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2020:09. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags. Due to the close behavior of some of the models compared, and rounding of the reported values, a few comparisons show a significant relative RMSE of 1.00. These cases arise from persistent differences in performance that are, however, too small to be relevant after rounding.

Table S.25: ELB set to 12.5bp: Relative MAE of median forecasts (through 2020:09)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	5.82	5.56	5.65	6.00	1.01*	1.02	1.04	0.99	1.00	1.00	1.00	1.00
Real Consumption	5.32	5.40	5.44	6.18	1.02	1.01	1.01	0.96	0.99	1.00	1.00	1.00
IP	7.57	7.18	7.38	8.03	1.00	1.02	1.02	0.95	1.01	1.00	1.02***	1.03**
Capacity Utilization	0.99	1.28	1.82	2.82	1.00	1.04	1.13	1.15	1.02**	1.00	1.02	1.13**
Unemployment	0.46	0.54	0.69	1.10	1.00	1.00	1.07**	1.23***	1.00	0.99	0.97*	0.98
Nonfarm Payrolls	3.38	3.13	3.25	3.68	1.00	1.01**	1.05*	1.12***	0.99	0.99*	1.00	1.02
Hours	0.22	0.23	0.26	0.32	1.00	1.03*	1.12	1.38*	1.00	0.99	1.00	1.04
Hourly Earnings	1.82	1.76	1.86	2.23	1.00	0.99	0.94	0.88*	1.00	1.00	1.00	0.98
PPI (Fin. Goods)	6.40	6.20	6.33	6.67	1.00	0.99	0.97	0.93	1.00	1.00	0.99*	0.99
PPI (Metals)	28.13	27.83	26.60	23.08	1.00	0.99	0.99	1.01	1.00	1.00	1.00	1.00
PCE Prices	1.78	1.76	2.10	2.65	0.99	0.96	0.90*	0.77*	1.02	1.01	0.99	0.98
Federal Funds Rate	0.29	0.52	0.93	1.39	0.51**	0.60	0.69	0.79	0.38***	0.41*	0.46	0.54**
Housing Starts	0.08	0.10	0.15	0.24	1.02	0.97	0.93	1.07	0.99	0.99	0.99	0.98
S&P 500	31.48	29.16	28.91	26.95	1.00	1.03	1.02	1.05	1.00	0.99	1.00	0.99
USD / GBP FX Rate	19.64	18.33	18.38	18.13	1.01	1.01	1.00	1.02	1.00	1.00	0.99	0.99***
5-Year Yield	0.39	0.61	0.86	1.06	0.98	1.02	1.24	1.52	0.95	0.99	0.98	0.96
10-Year Yield	0.37	0.59	0.84	0.91	1.01	1.05*	1.27	1.77	1.00	1.00	0.99	0.95
Baa Spread	0.52	0.76	1.08	1.05	0.98	1.00	1.03	1.25	1.05	1.07	1.01	0.89**

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2020:09. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags.

Table S.26: ELB set to 12.5bp: Relative MAD of median forecasts (through 2020:09)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	2.46	2.47	2.34	2.16	1.08	1.05	1.11	1.07	1.01	0.97	0.96	1.01
Real Consumption	1.76	1.62	1.74	2.39	1.06	1.06	1.08	0.90	1.05	1.10	1.09	0.98
IP	4.30	4.23	4.51	5.38	0.94	1.01	1.10	0.86	1.02	1.02	1.08	1.04
Capacity Utilization	0.45	0.82	1.27	2.10	1.01	1.00	1.05	1.14	1.01	1.07	1.00	1.28
Unemployment	0.14	0.20	0.35	0.79	1.00	1.01	1.17	1.32	1.00	1.00	0.93	0.90
Nonfarm Payrolls	0.76	1.02	1.05	1.41	0.98	1.00	1.13	1.31	1.03	0.99	1.02	1.01
Hours	0.15	0.16	0.21	0.23	1.00	1.04	1.02	1.29	0.99	1.04	0.99	1.04
Hourly Earnings	1.47	1.35	1.42	1.89	1.05	1.00	0.80	0.86	1.00	0.99	0.99	0.98
PPI (Fin. Goods)	4.85	4.87	4.76	5.72	1.02	0.98	0.98	0.94	1.04	0.98	0.99	0.98
PPI (Metals)	20.38	20.72	19.44	18.11	1.01	0.99	1.01	1.01	1.00	1.02	0.99	0.97
PCE Prices	1.33	1.47	1.78	2.08	1.02	0.99	0.86	0.78	1.04	0.98	0.93	1.05
Federal Funds Rate	0.15	0.28	0.54	0.97	0.75	0.97	1.09	1.13	0.37	0.36	0.46	0.54
Housing Starts	0.06	0.08	0.10	0.14	0.99	0.94	0.79	1.29	0.89	1.03	0.93	0.93
S&P 500	23.17	20.97	22.00	18.54	1.02	1.04	0.99	1.06	0.98	1.03	1.01	1.02
USD / GBP FX Rate	16.17	14.84	15.05	15.13	1.01	0.99	1.00	1.06	1.00	1.01	0.95	1.01
5-Year Yield	0.30	0.51	0.77	1.06	1.01	0.98	1.34	1.11	0.94	0.98	0.97	0.79
10-Year Yield	0.30	0.51	0.71	0.75	0.95	0.97	1.28	1.38	0.95	0.95	1.06	0.83
Baa Spread	0.32	0.49	0.82	0.87	0.99	1.02	0.86	0.82	1.06	0.95	0.96	0.81

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2020:09.

Table S.27: ELB set to 12.5bp: Relative CRPS of density forecasts (through 2020:09)

Variable / Horizon	Relative to Standard ...																	
	Standard						Truncated						Shadow rate					
	3	6	12	24	3	6	3	6	12	24	3	6	3	6	12	24		
Real Income	5.08	4.93	5.12	5.88	1.00	1.01	1.01	1.01	1.01	1.01	1.00	1.00	1.00	1.00	1.00	1.01		
Real Consumption	5.07	4.91	5.01	5.78	1.01	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.01		
IP	6.02	5.87	6.18	6.99	1.00	1.01	1.01	1.01	1.01	0.99	1.00	1.00	1.00	1.00	1.01***	1.03**		
Capacity Utilization	0.78	1.00	1.44	2.32	1.01*	1.03*	1.03*	1.09	1.13**	1.13**	1.01***	1.00	1.02	1.02	1.08***			
Unemployment	0.37	0.47	0.59	0.86	1.00	1.00	1.00	1.03***	1.15***	1.00	0.99**	1.00	0.99**	0.98**	0.98			
Nonfarm Payrolls	2.94	2.79	2.99	3.43	1.00	1.01**	1.03*	1.06***	1.00*	1.00	1.00	1.00	1.00	1.00	1.01	1.01		
Hours	0.17	0.18	0.21	0.28	1.00	1.02**	1.10	1.21*	1.01*	1.01	1.01	1.01	1.01	1.01	1.08***			
Hourly Earnings	1.37	1.34	1.45	1.84	1.00	0.99	0.98	0.97***	1.01*	1.00	1.01**	1.00	1.01**	1.02***				
PPI (Fin. Goods)	4.78	4.63	4.72	5.22	1.00	1.00	1.00	0.99	0.98	0.98	1.00	1.00	1.00	1.00	1.01	1.01		
PPI (Metals)	20.63	20.31	20.37	20.63	1.00	1.00	1.00	0.99	1.01	1.01	1.00	1.00	1.00*	1.00*	1.02***			
PCE Prices	1.31	1.32	1.50	1.94	0.99	0.97	0.95	0.91*	1.01	0.91*	1.01	1.00	1.00	1.00	1.00	1.00		
Federal Funds Rate	0.21	0.38	0.68	1.05	0.51**	0.56	0.63	0.72	0.40***	0.43**	0.45*	0.52***	0.45*	0.52***				
Housing Starts	0.06	0.07	0.11	0.19	1.00	0.99	1.00	1.00	1.09	1.09	1.00	0.99	0.97	0.97	0.97	0.97		
S&P 500	24.00	22.40	22.86	24.77	1.00	1.01	1.01	1.01	1.02	1.02	1.00	1.00	1.00	1.00	1.02***			
USD / GBP FX Rate	14.68	13.90	14.14	15.49	1.00	1.00	1.00	1.00	1.01	1.01	1.00	1.00	1.00	1.00	1.01**			
5-Year Yield	0.28	0.44	0.62	0.81	0.98	1.03	1.18	1.37	0.96	0.96	0.99	0.99	0.97	0.97	0.91*			
10-Year Yield	0.27	0.42	0.59	0.70	1.00	1.04**	1.22	1.56	1.00	1.00	1.01	1.00	1.00	1.00	0.98			
Baa Spread	0.37	0.54	0.74	0.87	0.98	1.00	1.06	1.20	1.05	1.05	1.07	1.03	1.03	0.95				

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2020:09. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags. Due to the close behavior of some of the models compared, and rounding of the reported values, a few comparisons show a significant relative CRPS of 1.00. These cases arise from persistent differences in performance that are, however, too small to be relevant after rounding.

Table S.28: ELB set to 12.5bp: Relative RMSE of mean forecasts (through 2017:12)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	8.06	7.69	7.81	8.29	1.00*	1.01	1.03	1.03	1.00	1.00	1.00	0.94***
Real Consumption	3.17	2.98	2.95	3.36	1.01*	1.01	1.01	0.94	0.99	1.00	1.00	1.02
IP	5.98	6.33	6.00	6.80	1.00	1.06	1.07	0.93	1.00	1.00	1.03***	1.00
Capacity Utilization	0.70	1.27	2.06	3.42	1.01	1.08	1.26	1.34	1.02***	1.00	1.02	1.12***
Unemployment	0.22	0.28	0.45	0.88	1.00	1.00	1.13***	1.43***	1.00	0.98	0.95	0.99
Nonfarm Payrolls	1.28	1.38	1.32	1.51	1.00	1.06	1.27	1.43**	0.99*	0.96	0.97	1.06
Hours	0.20	0.25	0.29	0.35	1.00	1.04*	1.26	1.64	1.01	0.99	0.98	1.06*
Hourly Earnings	2.28	2.33	2.40	2.77	1.00	0.97	0.96	0.90***	1.00	1.00	1.00	0.96***
PPI (Fin. Goods)	7.66	7.48	7.60	7.76	1.00	0.99	0.95	0.91	1.00	1.00	0.99*	0.98
PPI (Metals)	40.22	39.88	37.00	29.45	1.00	0.99	0.99	1.01	1.00	1.00	1.01*	1.00
PCE Prices	2.25	2.31	2.64	3.17	0.98	0.94	0.89	0.74	1.00	1.00	1.00	0.97
Federal Funds Rate	0.47	0.97	1.59	1.88	0.38	0.40	0.54	1.01	0.31	0.30	0.39	0.76
Housing Starts	0.09	0.12	0.21	0.36	0.99	0.97	0.96	1.05	1.01	1.01	1.00	1.01
S&P 500	38.81	34.85	35.38	32.99	1.01	1.03	1.04	1.05	0.99	0.99	1.00	0.99
USD / GBP FX Rate	26.66	24.58	24.31	23.55	1.01	1.00	0.99	1.00	1.00	1.00	1.00	0.99*
5-Year Yield	0.46	0.73	1.03	1.33	1.01	1.04	1.31	1.93	1.00	0.96	0.96	1.02
10-Year Yield	0.47	0.72	0.98	1.14	1.01	1.06**	1.37	2.29	1.02	0.99	0.99	1.02
Baa Spread	0.73	1.36	1.83	1.45	1.01	1.05	1.25	2.26	1.08	1.09	1.08	0.88**

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2017:12. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags. Due to the close behavior of some of the models compared, and rounding of the reported values, one of the comparisons shows a significant relative RMSE of 1.00. This case arises from persistent differences in performance that are, however, too small to be relevant after rounding.

Table S.29: ELB set to 12.5bp: Relative MAE of median forecasts (through 2017:12)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	3.96	3.71	3.71	3.71	1.01**	1.03	1.07	0.98	1.00	0.99	0.99	1.00
Real Consumption	2.37	2.16	2.19	2.64	1.00	1.02	1.03	0.89	0.99	1.00	1.01	1.01
IP	4.73	5.02	4.86	5.31	0.99	1.04	1.03	0.93	1.01	0.99	1.05***	1.05***
Capacity Utilization	0.55	0.97	1.61	2.68	1.01	1.05	1.18	1.18	1.01	1.00	1.02	1.16***
Unemployment	0.17	0.23	0.38	0.78	1.00	1.00	1.15***	1.35***	1.00	0.98	0.94*	0.96
Nonfarm Payrolls	0.97	1.06	1.05	1.29	1.00	1.04*	1.17*	1.35***	0.99	0.97*	1.00	1.07
Hours	0.16	0.19	0.23	0.27	1.00	1.03*	1.16	1.49*	1.01	0.99	0.99	1.05
Hourly Earnings	1.74	1.74	1.82	2.20	1.01	0.98	0.92	0.87*	1.01**	1.01	1.00	0.97
PPI (Fin. Goods)	5.99	5.92	5.97	6.17	1.00	0.98	0.96	0.92	1.01	1.00	0.98**	0.99
PPI (Metals)	29.80	29.78	27.71	22.52	0.99	0.99	0.99	1.01	1.00	1.00	1.01	1.00
PCE Prices	1.78	1.83	2.10	2.57	0.98	0.95	0.88*	0.74	1.01	1.01	0.99	0.98
Federal Funds Rate	0.25	0.52	0.95	1.44	0.46*	0.51	0.64	0.77	0.33**	0.30*	0.38	0.51**
Housing Starts	0.07	0.10	0.16	0.25	1.00	0.95	0.92	1.07	0.99	0.99	0.99	0.97
S&P 500	28.42	26.32	26.87	24.29	1.01*	1.04	1.02	1.06	1.00	0.99	0.99	0.99
USD / GBP FX Rate	19.35	18.07	18.13	17.84	1.01	1.01	1.00	1.03	1.00	1.00	0.99	0.99***
5-Year Yield	0.36	0.59	0.84	1.06	1.01	1.02	1.29	1.56	1.01	0.98	0.97	0.95
10-Year Yield	0.36	0.57	0.82	0.90	1.02	1.05*	1.33	1.83	1.02	0.99	0.98	0.95*
Baa Spread	0.47	0.79	1.15	1.09	1.00	1.01	1.04	1.26	1.07*	1.09	1.03	0.88**

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2017:12. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags.

Table S.30: ELB set to 12.5bp: Relative MAD of median forecasts (through 2017:12)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	2.27	2.21	2.03	2.06	1.01	1.07	1.12	1.04	1.00	1.01	1.05	0.98
Real Consumption	1.71	1.49	1.53	2.12	0.97	1.05	1.11	0.97	1.02	1.03	1.11	1.03
IP	4.16	4.19	4.20	5.07	0.93	1.04	1.12	0.89	1.04	1.02	1.05	1.06
Capacity Utilization	0.44	0.75	1.12	1.91	1.01	0.99	1.14	1.13	0.98	0.97	1.07	1.39
Unemployment	0.14	0.20	0.33	0.79	1.00	1.01	1.17	1.30	1.00	1.00	0.95	0.88
Nonfarm Payrolls	0.75	0.95	0.94	1.29	0.99	1.02	1.15	1.34	1.01	1.00	1.08	1.04
Hours	0.14	0.16	0.20	0.22	1.01	1.03	1.06	1.35	1.03	1.02	1.06	1.11
Hourly Earnings	1.46	1.35	1.44	1.91	1.03	1.01	0.78	0.82	1.01	1.01	0.99	0.92
PPI (Fin. Goods)	4.82	4.88	4.42	5.54	1.00	1.02	1.01	0.94	0.97	0.97	1.02	0.97
PPI (Metals)	21.81	25.35	20.14	17.98	0.97	0.94	1.01	0.99	1.05	0.91	0.96	0.95
PCE Prices	1.46	1.53	1.80	2.02	0.97	0.99	0.86	0.77	1.01	0.96	0.96	1.01
Federal Funds Rate	0.14	0.25	0.49	1.00	0.66	1.01	1.12	1.17	0.28	0.26	0.37	0.44
Housing Starts	0.06	0.08	0.11	0.14	1.01	0.92	0.81	1.25	0.88	1.03	0.95	0.91
S&P 500	21.77	20.48	22.11	18.18	1.04	1.01	0.98	1.06	1.02	0.96	0.95	0.98
USD / GBP FX Rate	14.42	14.28	13.64	15.00	1.05	1.00	1.06	1.05	1.04	0.99	1.00	1.02
5-Year Yield	0.28	0.47	0.72	1.00	0.97	0.94	1.56	1.08	1.01	0.99	1.01	0.78
10-Year Yield	0.27	0.51	0.66	0.73	0.92	0.96	1.37	1.36	0.95	0.89	1.04	0.78
Baa Spread	0.32	0.49	0.82	0.98	0.99	1.00	0.83	0.78	1.04	0.98	0.97	0.80

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2017:12.

Table S.31: ELB set to 12.5bp: Relative CRPS of density forecasts (through 2017:12)

Variable / Horizon	Relative to Standard ...											
	Standard				Truncated				Shadow rate			
	3	6	12	24	3	6	12	24	3	6	12	24
Real Income	3.30	3.23	3.42	3.86	1.00	1.01	1.03	1.02	1.00	1.00	1.01	1.03***
Real Consumption	1.83	1.80	1.95	2.49	1.01*	1.00	1.01	1.00	1.00	1.00	1.01	1.03**
IP	3.45	3.73	3.84	4.62	1.00	1.02	1.02	0.99	1.00	1.00	1.03***	1.05***
Capacity Utilization	0.42	0.74	1.29	2.25	1.01	1.04	1.12	1.15**	1.02***	1.01	1.03	1.09***
Unemployment	0.12	0.17	0.29	0.57	1.00	1.00	1.09***	1.25***	1.00	0.97**	0.96**	0.97
Nonfarm Payrolls	0.71	0.78	0.87	1.17	1.00	1.03*	1.11*	1.17***	0.99**	0.98*	0.99	1.05*
Hours	0.12	0.14	0.18	0.25	1.00	1.03**	1.14	1.26**	1.01	1.01	1.01	1.10***
Hourly Earnings	1.30	1.34	1.43	1.83	1.00	0.99	0.98	0.97***	1.01**	1.00	1.01**	1.01**
PPI (Fin. Goods)	4.32	4.33	4.44	4.84	1.00	0.99	0.98	0.97	1.00	1.00	1.00	1.01
PPI (Metals)	21.79	21.74	21.30	20.58	0.99*	0.99	0.99	1.01	1.00	1.00	1.01*	1.02***
PCE Prices	1.27	1.35	1.50	1.91	0.99	0.97*	0.94	0.90*	1.01	1.00	1.00	1.00
Federal Funds Rate	0.18	0.38	0.71	1.09	0.44**	0.47	0.57	0.71	0.33**	0.31**	0.37*	0.50***
Housing Starts	0.05	0.07	0.11	0.19	0.99	0.99	0.99	1.09	0.99	0.98	0.97	0.97
S&P 500	20.98	20.18	21.49	23.03	1.00	1.02	1.02	1.02	1.00	1.00	1.01	1.02***
USD / GBP FX Rate	14.62	14.12	14.22	15.40	1.00	1.00	1.00	1.01	1.00	1.00	1.00	1.01**
5-Year Yield	0.26	0.42	0.60	0.82	1.01	1.03	1.21	1.39	1.00	0.98	0.95	0.89**
10-Year Yield	0.26	0.41	0.57	0.71	1.01	1.05**	1.27	1.60	1.02	1.00	0.99	0.97
Baa Spread	0.33	0.57	0.79	0.90	1.00	1.01	1.07	1.22	1.07	1.08	1.05	0.95

Note: Comparison of “Standard” (baseline, in denominator of relative comparisons) against “Truncated” and “Shadow rate.” Values below 1 indicate improvement over baseline. Evaluation window from 2009:01 through 2017:12. Significance assessed by Diebold-Mariano-West test using Newey-West standard errors with $h + 1$ lags.