

Not-for-Publication Appendix of Additional Results for
“Forecasting U.S. Employment Growth Using Forecast Combining Methods”

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Table A1: ARDL model forecasting results, U.S employment growth, 1981 recession (1978:08–1984:07 out-of-sample evaluation period)

Model	Recursive window				Rolling window			
	$h = 3$	$h = 6$	$h = 12$	$h = 24$	$h = 3$	$h = 6$	$h = 12$	$h = 24$
AR benchmark	5.95	5.35	4.14	2.94	5.84	5.31	4.27	3.10
Unemployment rate	0.92	0.95	1.24	1.70	1.04	1.10	1.52	2.08
Manufacturing unfilled orders	0.99	1.05	0.94	1.13	1.07	1.01	1.27	0.86
Manufacturing weekly hours	1.05	1.11	1.06	1.00	1.05	1.03	1.12	1.20
Unemployment claims	1.03	1.05	1.58	2.17	1.15	1.32	1.44	2.75
Manufacturing new consumer orders	0.98	0.87	0.88	0.92	1.14	0.92	1.09	1.06
Vendor performance	1.14	1.14	1.18	1.41	1.22	1.58	1.48	2.26
Manufacturing new capital orders	0.93	0.95	0.98	1.06	1.02	1.04	1.12	1.22
Building permits	0.74	0.58	0.61	0.80	0.76	0.54	0.68	1.14
Stock price index	1.00	0.91	0.96	1.20	1.09	1.13	1.33	1.69
M2 money supply	0.95	0.87	0.62	0.51	1.04	0.97	0.77	0.66
Interest rate spread	0.95	0.66	0.33	0.35	1.03	0.74	0.30	0.45
Consumer confidence	0.97	1.15	1.32	2.13	0.82	0.82	0.88	1.86
Personal income	1.14	1.08	1.09	1.20	1.30	1.54	1.93	1.41
Industrial production	0.96	0.91	0.94	0.96	1.02	1.06	1.17	1.24
Manufacturing sales	0.72	0.71	0.86	0.91	0.75	0.77	0.98	1.24
Unemployment duration	1.01	0.99	1.00	1.12	1.02	1.10	1.52	1.77
Help wanted ratio	0.84	0.88	0.93	0.95	0.98	0.92	1.14	1.06
Prime rate	1.36	1.14	0.99	0.91	1.27	1.22	1.21	0.83
Loans outstanding	0.97	0.88	0.87	1.04	0.93	0.74	0.88	0.95
Consumer credit	1.00	0.96	0.98	1.32	1.02	1.06	1.07	1.90
Labor force	0.86	0.82	0.95	0.98	0.95	0.92	1.12	1.29
Male labor force participation	0.91	0.98	1.00	1.01	0.93	1.00	1.08	1.24
Female labor force participation	0.87	0.86	0.94	1.00	0.99	0.94	1.07	1.20
Teenage labor force participation	1.00	1.01	1.01	1.01	1.04	1.09	1.15	2.10
Manufacturing overtime	1.07	0.86	0.83	0.95	1.05	1.15	1.47	1.48
Help wanted advertising	0.74	0.62	0.73	0.79	0.91	0.77	1.18	1.34
Business fixed investment	1.01	0.99	1.00	1.08	0.96	0.93	0.80	0.92
10-year bond yield	1.62	1.81	1.87	2.80	1.44	1.15	1.14	0.50
CPI	0.97	0.81	0.52	0.47	1.25	1.19	0.95	0.99
PPI	1.02	0.85	0.79	1.27	1.06	1.50	1.56	1.24

Notes: The first row indicates whether the ARDL models are estimated using a recursive or rolling window. For the AR benchmark model, the entries report the MSFE. Other entries report the ratio of the MSFE for the ARDL model to the MSFE for the AR benchmark model. Bold entries indicate the ARDL model with the lowest MSFE.

Table A2: ARDL model forecasting results, U.S employment growth, 1980 recession (1977:02–1983:01 out-of-sample evaluation period)

Model	Recursive window				Rolling window			
	$h = 3$	$h = 6$	$h = 12$	$h = 24$	$h = 3$	$h = 6$	$h = 12$	$h = 24$
AR benchmark	5.85	4.72	3.80	2.96	5.73	4.66	3.83	3.20
Unemployment rate	0.94	1.01	1.21	1.15	1.06	1.20	1.38	1.01
Manufacturing unfilled orders	1.00	1.08	0.99	0.90	1.32	1.10	1.22	0.71
Manufacturing weekly hours	1.13	1.17	1.12	1.01	1.15	1.13	1.59	1.62
Unemployment claims	1.10	1.17	1.59	1.70	1.40	1.44	1.52	1.84
Manufacturing new consumer orders	1.07	1.00	0.95	0.95	1.18	1.07	1.47	1.28
Vendor performance	1.14	1.07	1.05	1.11	1.25	1.52	1.17	1.58
Manufacturing new capital orders	0.96	0.98	0.99	1.03	1.06	1.04	1.18	1.47
Building permits	0.74	0.56	0.70	0.73	0.82	0.60	1.09	1.31
Stock price index	1.15	1.24	1.34	1.21	1.18	1.31	1.68	1.75
M2 money supply	1.11	1.10	0.86	0.59	1.20	1.20	1.17	0.71
Interest rate spread	0.92	0.57	0.30	0.37	1.11	0.73	0.17	0.39
Consumer confidence	1.07	1.30	1.50	1.60	1.00	1.06	1.29	1.49
Personal income	1.19	1.05	1.08	1.18	1.53	1.58	2.02	1.28
Industrial production	1.05	1.00	0.99	0.99	1.12	1.12	2.00	1.42
Manufacturing sales	0.84	0.81	0.89	0.98	0.91	0.90	1.15	1.33
Unemployment duration	1.05	1.04	1.05	0.82	1.05	1.42	1.09	1.05
Help wanted ratio	0.88	1.03	1.01	1.01	1.02	1.05	1.60	1.43
Prime rate	1.41	1.21	0.95	0.57	1.44	1.32	1.11	0.53
Loans outstanding	1.02	0.91	0.97	0.76	0.96	0.87	0.83	0.63
Consumer credit	1.00	0.98	0.99	0.94	1.09	1.06	1.11	1.21
Labor force	0.93	0.91	0.97	0.98	0.99	1.00	1.18	1.26
Male labor force participation	0.86	1.03	0.99	1.00	0.97	1.15	1.36	1.37
Female labor force participation	0.94	0.91	0.93	1.02	0.99	1.13	1.40	1.61
Teenage labor force participation	1.00	1.03	0.99	1.00	1.08	1.14	1.18	2.03
Manufacturing overtime	1.16	1.01	0.97	1.00	1.09	1.40	2.09	1.37
Help wanted advertising	0.79	0.68	0.81	0.81	1.02	0.90	1.42	1.63
Business fixed investment	1.05	1.05	0.99	0.83	0.91	0.96	0.87	0.79
10-year bond yield	1.05	0.83	0.60	0.40	1.30	1.16	0.82	0.64
CPI	1.03	0.94	0.94	1.12	1.49	1.45	1.06	0.97
PPI	1.03	1.00	0.87	0.76	1.21	1.60	1.23	0.87

Notes: The first row indicates whether the ARDL models are estimated using a recursive or rolling window. For the AR benchmark model, the entries report the MSFE. Other entries report the ratio of the MSFE for the ARDL model to the MSFE for the AR benchmark model. Bold entries indicate the ARDL model with the lowest MSFE.

Table A3: ARDL model forecasting results, U.S employment growth, 1973 recession (1970:12–1976:11 out-of-sample evaluation period)

Model	Recursive window				Rolling window			
	$h = 3$	$h = 6$	$h = 12$	$h = 24$	$h = 3$	$h = 6$	$h = 12$	$h = 24$
AR benchmark	6.62	5.11	3.71	2.55	7.58	5.71	3.73	2.78
Unemployment rate	0.86	0.92	0.76	0.45	0.94	0.85	1.49	0.78
Manufacturing unfilled orders	1.09	1.10	1.02	0.91	1.06	0.92	1.14	0.46
Manufacturing weekly hours	1.02	1.03	1.01	1.11	1.12	1.41	1.79	1.45
Unemployment claims	0.98	1.10	1.10	0.63	0.87	1.46	2.07	1.43
Manufacturing new consumer orders	0.93	1.00	1.05	0.98	0.85	1.12	1.26	1.27
Vendor performance	1.01	1.11	0.86	0.82	0.75	0.69	0.72	0.40
Manufacturing new capital orders	1.01	1.01	1.05	1.00	0.97	1.13	1.26	1.36
Building permits	1.02	0.86	0.86	0.74	1.24	1.49	1.80	0.98
Stock price index	0.95	0.81	0.87	0.96	0.72	0.82	0.93	1.19
M2 money supply	0.96	0.91	0.82	0.83	0.89	0.67	0.74	0.82
Interest rate spread	0.88	0.83	0.57	0.37	0.89	0.76	0.31	0.27
Consumer confidence	1.07	1.26	1.34	0.91	0.96	1.28	1.37	1.20
Personal income	1.10	0.94	0.94	1.04	1.25	1.08	1.11	1.45
Industrial production	1.10	1.15	1.13	1.10	0.90	1.21	1.95	1.42
Manufacturing sales	0.97	1.00	1.06	1.05	1.03	1.30	1.32	1.27
Unemployment duration	0.97	0.93	0.79	0.74	0.95	0.89	0.92	1.53
Help wanted ratio	0.87	1.04	0.91	0.94	0.76	0.91	1.40	1.32
Prime rate	1.10	1.04	0.89	0.75	1.29	1.08	0.78	0.48
Loans outstanding	1.02	0.98	0.78	0.42	0.99	1.04	1.05	0.44
Consumer credit	1.01	1.05	1.05	0.99	1.25	1.49	1.47	1.34
Labor force	0.87	0.97	1.11	1.05	0.93	0.97	2.41	2.29
Male labor force participation	0.97	0.98	1.04	1.04	0.99	1.40	1.57	1.15
Female labor force participation	1.05	1.16	1.03	1.12	1.20	1.43	1.49	1.81
Teenage labor force participation	0.99	0.99	0.99	1.00	1.09	1.00	1.25	1.34
Manufacturing overtime	1.04	1.05	0.97	1.03	1.06	1.17	1.48	1.35
Help wanted advertisting	0.60	0.69	0.84	0.99	0.62	0.74	0.85	0.60
Business fixed investment	1.14	0.98	0.68	0.26	1.17	0.90	0.75	0.36
10-year bond yield	1.01	1.01	1.00	0.95	1.14	1.29	0.86	0.87
CPI	1.11	1.25	1.26	1.29	1.08	1.28	1.22	1.60
PPI	1.08	1.19	1.15	1.11	1.09	1.29	1.48	0.99

Notes: The first row indicates whether the ARDL models are estimated using a recursive or rolling window. For the AR benchmark model, the entries report the MSFE. Other entries report the ratio of the MSFE for the ARDL model to the MSFE for the AR benchmark model. Bold entries indicate the ARDL model with the lowest MSFE.

Table A4: Forecast combining results, U.S employment growth, 1981 recession (1978:08–1984:07 out-of-sample evaluation period)

Combining method	Recursive window				Rolling window			
	$h = 3$	$h = 6$	$h = 12$	$h = 24$	$h = 3$	$h = 6$	$h = 12$	$h = 24$
AR benchmark	5.95	5.35	4.14	2.94	5.84	5.31	4.27	3.10
Mean	0.84	0.80	0.78	0.87	0.84	0.83	0.83	0.97
Median	0.88	0.85	0.88	0.97	0.87	0.86	0.94	1.08
Trimmed mean	0.88	0.86	0.87	0.96	0.89	0.89	0.92	1.07
OLS, recursive	1.19	0.99	1.09	0.38	1.64	0.75	0.90	1.58
OLS, rolling	1.47	1.31	1.18	0.64	2.17	1.26	1.22	3.49
WLS, t-lambda, $\lambda = 1$	1.45	1.06	1.22	0.54	1.98	0.96	0.84	2.79
WLS, t-lambda, $\lambda = 3$	1.65	1.39	1.44	0.70	2.71	1.56	1.08	4.73
Discount MSFE, $\delta = 1.0$	0.83	0.79	0.74	0.77	0.84	0.82	0.72	0.82
Discount MSFE, $\delta = 0.9$	0.84	0.80	0.72	0.78	0.85	0.83	0.76	0.88
Most recently best	1.06	0.81	0.74	0.91	1.39	0.81	0.55	1.56
Shrinkage, $\kappa = 0.5$	1.00	0.93	0.95	0.33	1.27	0.67	0.87	1.01
Shrinkage, $\kappa = 1.0$	0.89	0.86	0.88	0.41	1.05	0.64	0.82	0.86
Cluster, $C(2, PB)$	0.85	0.79	0.67	0.81	0.85	0.81	0.67	0.78
Cluster, $C(3, PB)$	0.84	0.75	0.64	0.85	0.80	0.78	0.61	0.73
Model selection, M-TST	1.35	1.46	0.98	0.74	2.01	1.06	0.85	3.14
PC, $m = 1$	0.87	0.89	1.04	1.43	0.88	0.93	1.05	1.62
PC, $m = 2$	0.85	0.80	0.55	0.53	0.89	0.95	0.86	0.66
PC, IC_{p3}	0.86	0.77	0.62	0.58	0.84	0.72	0.68	0.66
ABMA, SIC	0.91	0.77	0.90	0.78	1.15	0.90	1.20	0.96
ABMA, AIC	1.17	0.83	0.91	1.16	1.17	0.90	1.03	1.04
AFTER	0.88	1.00	1.15	1.41	0.96	1.05	1.10	2.16

Notes: The first row indicates whether the ARDL models are estimated using a recursive or rolling window. For the AR benchmark model, the entries report the MSFE. Other entries report the ratio of the MSFE for the combining method to the MSFE for the AR benchmark model. Bold entries indicate the combining method with the lowest MSFE.

Table A5: Forecast combining results, U.S employment growth, 1981 recession (1977:02–1983:01 out-of-sample evaluation period)

Combining method	Recursive window				Rolling window			
	$h = 3$	$h = 6$	$h = 12$	$h = 24$	$h = 3$	$h = 6$	$h = 12$	$h = 24$
AR benchmark	5.85	4.72	3.80	2.96	5.73	4.66	3.83	3.20
Mean	0.89	0.86	0.85	0.82	0.92	0.91	0.97	0.94
Median	0.93	0.91	0.93	0.95	0.93	0.94	1.03	1.11
Trimmed mean	0.89	0.86	0.85	0.79	0.92	0.90	0.96	0.93
OLS, recursive	1.31	0.84	0.97	0.49	1.79	1.21	1.21	4.13
OLS, rolling	1.58	1.18	0.93	0.68	2.41	2.02	0.77	2.62
WLS, t-lambda, $\lambda = 1$	1.51	0.94	0.89	0.61	1.94	1.61	0.81	3.60
WLS, t-lambda, $\lambda = 3$	1.71	1.11	0.98	0.99	2.22	2.10	0.65	2.52
Discount MSFE, $\delta = 1.0$	0.88	0.85	0.82	0.75	0.91	0.90	0.89	0.84
Discount MSFE, $\delta = 0.9$	0.89	0.86	0.80	0.75	0.92	0.90	0.90	0.90
Most recently best	1.09	0.95	0.70	0.81	1.24	0.76	0.62	1.57
Shrinkage, $\kappa = 0.5$	1.13	0.85	0.79	0.56	1.39	0.99	0.96	2.50
Shrinkage, $\kappa = 1.0$	1.02	0.77	0.73	0.60	1.15	0.82	0.83	1.57
Cluster, $C(2, PB)$	0.89	0.86	0.76	0.76	0.94	0.89	0.92	0.85
Cluster, $C(3, PB)$	0.88	0.82	0.74	0.72	0.96	0.89	0.78	0.66
Model selection, M-TST	1.49	1.30	0.76	0.62	2.08	1.84	0.79	3.13
PC, $m = 1$	0.90	0.90	0.98	1.19	0.92	0.94	1.08	1.23
PC, $m = 2$	0.90	0.83	0.55	0.44	0.94	1.00	0.93	1.15
PC, IC_{p3}	0.87	0.94	0.84	0.45	0.94	0.90	0.69	0.53
ABMA, SIC	0.94	0.86	0.92	0.69	1.41	0.89	0.85	0.87
ABMA, AIC	1.21	0.86	0.94	1.08	1.03	0.89	0.97	1.00
AFTER	0.79	0.75	1.14	0.81	1.13	1.11	1.07	1.88

Notes: The first row indicates whether the ARDL models are estimated using a recursive or rolling window. For the AR benchmark model, the entries report the MSFE. Other entries report the ratio of the MSFE for the combining method to the MSFE for the AR benchmark model. Bold entries indicate the combining method with the lowest MSFE.

Table A6: Forecast combining results, U.S employment growth, 1973 recession (1970:12–1976:11 out-of-sample evaluation period)

Combining method	Recursive window				Rolling window			
	$h = 3$	$h = 6$	$h = 12$	$h = 24$	$h = 3$	$h = 6$	$h = 12$	$h = 24$
AR benchmark	6.62	5.11	3.71	2.55	7.58	5.71	3.73	2.78
Mean	0.90	0.91	0.87	0.81	0.81	0.84	0.79	0.69
Median	0.94	0.96	0.93	0.93	0.85	0.91	0.87	0.80
Trimmed mean	0.89	0.93	0.89	0.88	0.80	0.85	0.80	0.73
OLS, recursive	1.64	3.23	1.49	3.53	2.53	2.88	3.24	4.69
OLS, rolling	1.94	4.51	1.42	5.17	2.90	5.33	6.64	11.59
WLS, t-lambda, $\lambda = 1$	1.69	4.04	1.71	2.79	2.64	4.23	3.59	7.02
WLS, t-lambda, $\lambda = 3$	1.97	3.90	1.76	3.58	2.06	4.21	6.30	10.49
Discount MSFE, $\delta = 1.0$	0.89	0.91	0.86	0.82	0.80	0.84	0.76	0.71
Discount MSFE, $\delta = 0.9$	0.89	0.90	0.85	0.78	0.79	0.81	0.71	0.73
Most recently best	0.89	0.95	0.79	0.66	0.96	0.81	1.00	0.46
Shrinkage, $\kappa = 0.5$	1.19	1.94	0.99	1.74	1.57	1.88	1.78	1.13
Shrinkage, $\kappa = 1.0$	0.95	1.20	0.85	1.02	1.03	1.24	1.08	0.86
Cluster, $C(2, PB)$	0.89	0.91	0.82	0.83	0.76	0.86	0.73	0.80
Cluster, $C(3, PB)$	0.89	0.87	0.83	0.79	0.75	0.79	0.66	0.67
Model selection, M-TST	1.81	3.77	1.11	4.95	2.88	4.53	6.28	11.03
PC, $m = 1$	0.89	0.92	0.91	0.87	0.83	0.87	0.85	0.70
PC, $m = 2$	0.88	0.83	0.64	0.72	0.78	1.07	0.67	0.77
PC, IC_{p3}	0.95	0.73	0.81	1.35	0.79	0.96	0.65	0.79
ABMA, SIC	0.89	0.89	0.87	0.91	0.68	1.13	0.94	1.11
ABMA, AIC	1.00	1.02	0.88	0.86	0.93	0.89	0.77	0.87
AFTER	0.96	1.05	0.98	0.86	0.82	0.81	0.91	0.86

Notes: The first row indicates whether the ARDL models are estimated using a recursive or rolling window. For the AR benchmark model, the entries report the MSFE. Other entries report the ratio of the MSFE for the combining method to the MSFE for the AR benchmark model. Bold entries indicate the combining method with the lowest MSFE.