

Online Appendix

to

ASSESSMENT OF MODELS TO FORECAST EXCHANGE RATES: THE QUETZAL–U.S. DOLLAR EXCHANGE RATE

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The sensitivity analysis for the MSE forecast comparison criterion is shown in Table A1. It presents the percentage difference between the MSE p-value from the original exchange rate specification forecast and the MSE p-value from forecasts performed through alternative specifications. There are seven groups, corresponding to a different value of λ used to calculate the cyclical component of each fundamental variable, each containing thirty-one results (one for each model specification). The results are presented for the one- and two-period-ahead forecasts. A positive value implies that the base model specification outperforms forecasts produced by all other alternative specifications, while a negative value implies the opposite. The sensitivity analysis for the direction of change forecast comparison criterion is presented in Table A2, with the same structure as the previous table.

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Table A1. Error correction criterion: p-value percentage differential

Dependent variable: $\hat{s}_t$

Combination number ¹	Independent regressors	One period ahead forecast							Two periods ahead forecast						
		Hodrick Prescott's Smoothing coefficient							Hodrick Prescott's Smoothing coefficient						
		100	600	1100	1600	2100	2600	3100	100	600	1100	1600	2100	2600	3100
1	$\rho, \hat{s}_{t-1}$	0.000	0.000	0.001	0.001	0.001	0.002	0.002	-0.002	0.001	0.003	0.004	0.006	0.006	0.007
2	$\rho, \hat{m}_t$	0.001	0.004	0.005	0.007	0.008	0.009	0.009	-0.002	0.000	0.000	-0.001	-0.002	-0.002	-0.003
3	$\rho, \hat{sug}_{t-1}$	0.003	0.006	0.008	0.009	0.011	0.012	0.013	-0.002	-0.001	-0.001	-0.002	-0.003	-0.003	-0.004
4	$\rho, \widehat{rem}_t$	0.003	0.005	0.007	0.008	0.009	0.010	0.010	-0.002	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002
5	$\rho, \hat{y}_{t-1}^*$	0.002	0.004	0.005	0.006	0.007	0.008	0.008	-0.002	-0.006	-0.008	-0.010	-0.011	-0.012	-0.013
6	$\rho, \hat{y}_{t-1}^*, \widehat{rem}_t$	0.002	0.003	0.004	0.004	0.004	0.005	0.005	-0.003	-0.006	-0.008	-0.009	-0.010	-0.011	-0.012
7	$\rho, \hat{y}_{t-1}^*, \hat{sug}_{t-1}$	0.002	0.006	0.008	0.009	0.010	0.011	0.012	-0.002	-0.004	-0.006	-0.008	-0.009	-0.010	-0.011
8	$\rho, \hat{sug}_{t-1}, \widehat{rem}_t$	0.003	0.006	0.007	0.008	0.009	0.010	0.010	-0.002	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002
9	$\rho, \hat{m}_t, \hat{y}_{t-1}^*$	0.001	0.005	0.008	0.010	0.011	0.013	0.014	-0.002	-0.006	-0.008	-0.009	-0.010	-0.010	-0.011
10	$\rho, \hat{m}_t, \widehat{rem}_t$	0.002	0.005	0.008	0.010	0.011	0.012	0.013	-0.002	0.000	0.000	0.000	0.000	0.000	0.000
11	$\rho, \hat{m}_t, \hat{sug}_{t-1}$	0.002	0.005	0.007	0.009	0.011	0.012	0.014	-0.002	0.000	-0.001	-0.001	-0.002	-0.002	-0.003
12	$\rho, \hat{s}_{t-1}, \hat{y}_{t-1}^*$	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002
13	$\rho, \hat{s}_{t-1}, \widehat{rem}_t$	0.000	0.000	0.001	0.001	0.001	0.001	0.001	-0.002	0.001	0.002	0.003	0.003	0.003	0.003
14	$\rho, \hat{s}_{t-1}, \hat{sug}_{t-1}$	0.000	0.001	0.001	0.002	0.002	0.002	0.002	-0.001	0.001	0.003	0.004	0.005	0.006	0.007
15	$\rho, \hat{s}_{t-1}, \hat{m}_t$	0.000	0.001	0.001	0.001	0.002	0.002	0.002	-0.002	0.002	0.005	0.006	0.008	0.009	0.009
16	$\rho, \hat{y}_{t-1}^*, \hat{sug}_{t-1}, \widehat{rem}_t$	0.002	0.004	0.005	0.006	0.006	0.007	0.008	-0.002	-0.005	-0.006	-0.008	-0.008	-0.009	-0.010
17	$\rho, \hat{m}_t, \hat{y}_{t-1}^*, \widehat{rem}_t$	0.001	0.004	0.006	0.007	0.008	0.009	0.010	-0.003	-0.006	-0.008	-0.009	-0.009	-0.010	-0.010
18	$\rho, \hat{m}_t, \hat{y}_{t-1}^*, \hat{sug}_{t-1}$	0.001	0.006	0.009	0.011	0.013	0.014	0.016	-0.002	-0.005	-0.007	-0.008	-0.008	-0.009	-0.010
19	$\rho, \hat{m}_t, \hat{sug}_{t-1}, \widehat{rem}_t$	0.002	0.005	0.008	0.009	0.011	0.012	0.013	-0.002	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002
20	$\rho, \hat{s}_{t-1}, \hat{y}_{t-1}^*, \widehat{rem}_t$	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002
21	$\rho, \hat{s}_{t-1}, \hat{y}_{t-1}^*, \hat{sug}_{t-1}$	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.000	-0.001	-0.001	-0.001	-0.001	-0.002
22	$\rho, \hat{s}_{t-1}, \hat{sug}_{t-1}, \widehat{rem}_t$	0.000	0.001	0.001	0.001	0.001	0.002	0.002	-0.002	0.001	0.002	0.003	0.003	0.003	0.003
23	$\rho, \hat{s}_{t-1}, \hat{m}_t, \hat{y}_{t-1}^*$	0.000	0.000	0.000	0.001	0.001	0.001	0.001	-0.001	0.002	0.002	0.002	0.002	0.002	0.002
24	$\rho, \hat{s}_{t-1}, \hat{m}_t, \widehat{rem}_t$	0.000	0.001	0.001	0.001	0.002	0.002	0.002	-0.002	0.002	0.004	0.005	0.005	0.006	0.006
25	$\rho, \hat{s}_{t-1}, \hat{m}_t, \hat{sug}_{t-1}$	0.000	0.001	0.002	0.002	0.002	0.003	0.003	-0.001	0.003	0.006	0.008	0.010	0.011	0.012
26	$\rho, \hat{s}_{t-1}, \hat{m}_t, \hat{sug}_{t-1}, \widehat{rem}_t$	0.000	0.001	0.002	0.002	0.002	0.002	0.003	-0.002	0.003	0.005	0.007	0.008	0.009	0.009
27	$\rho, \hat{s}_{t-1}, \hat{m}_t, \hat{y}_{t-1}^*, \hat{sug}_{t-1}$	0.000	0.001	0.001	0.002	0.002	0.002	0.002	0.000	0.004	0.005	0.005	0.005	0.006	0.006
28	$\rho, \hat{s}_{t-1}, \hat{m}_t, \hat{y}_{t-1}^*, \widehat{rem}_t$	0.000	0.000	0.000	0.001	0.001	0.001	0.001	-0.001	0.002	0.002	0.002	0.002	0.002	0.002
29	$\rho, \hat{s}_{t-1}, \hat{y}_{t-1}^*, \hat{sug}_{t-1}, \widehat{rem}_t$	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.000	-0.001	-0.001	-0.001	-0.001	-0.001
30	$\rho, \hat{m}_t, \hat{y}_{t-1}^*, \hat{sug}_{t-1}, \widehat{rem}_t$	0.002	0.005	0.006	0.007	0.008	0.009	0.010	-0.003	-0.005	-0.006	-0.007	-0.008	-0.008	-0.009
31	$\rho, \hat{s}_{t-1}, \hat{m}_t, \hat{y}_{t-1}^*, \hat{sug}_{t-1}, \widehat{rem}_t$	0.000	0.001	0.001	0.002	0.002	0.002	0.002	0.000	0.005	0.006	0.006	0.007	0.007	0.007

¹ The total number of five variable combinations is 31, where forecasts from the final combination (see the last row) based on a smoothing coefficient of 100 is the benchmark comparison forecast for all the remaining estimations. Therefore, negative (positive) values imply an improvement (worsening) respect to the base forecast.

Numbers in italics are negative, although it might be unnoticeable at 3 decimal approximations.

Table A2. Direction of change criterion: p-value percentage differential

Dependent variable: $\hat{s}_t$

Combination number ¹	Independent regressors	One period ahead forecast							Two periods ahead forecast						
		Hodrick Prescott's Smoothing coefficient							Hodrick Prescott's Smoothing coefficient						
		100	600	1100	1600	2100	2600	3100	100	600	1100	1600	2100	2600	3100
1	$\rho, \hat{s}_{t-1}$	0.260	0.754	0.760	0.760	0.760	0.760	0.758	0.030	0.069	0.230	0.354	0.494	0.494	0.354
2	$\rho, \hat{m}_t$	0.616	0.754	0.754	0.754	0.754	0.754	0.754	0.010	0.069	0.135	0.135	0.135	0.135	0.069
3	$\rho, \hat{sug}_{t-1}$	0.616	0.682	0.616	0.616	0.682	0.722	0.722	0.030	0.030	0.069	0.069	0.069	0.135	0.069
4	$\rho, \hat{rem}_t$	0.722	0.754	0.754	0.743	0.743	0.743	0.743	0.030	0.030	0.135	0.069	0.069	0.230	0.230
5	$\rho, \hat{y}_{t-1}^*$	0.722	0.722	0.682	0.722	0.722	0.722	0.743	0.030	0.000	0.135	0.135	0.030	0.030	0.030
6	$\rho, \hat{y}_{t-1}^*, \hat{rem}_t$	0.743	0.616	0.616	0.616	0.616	0.616	0.616	0.030	0.000	0.069	0.030	0.030	0.030	0.030
7	$\rho, \hat{y}_{t-1}^*, \hat{sug}_{t-1}$	0.682	0.682	0.682	0.682	0.682	0.682	0.722	0.030	0.030	0.135	0.010	0.010	0.010	0.010
8	$\rho, \hat{sug}_{t-1}, \hat{rem}_t$	0.682	0.722	0.722	0.722	0.722	0.722	0.722	0.030	0.030	0.069	0.135	0.135	0.135	0.135
9	$\rho, \hat{m}_t, \hat{y}_{t-1}^*$	0.743	0.743	0.722	0.743	0.743	0.743	0.743	0.030	0.010	0.135	0.069	0.030	0.030	0.030
10	$\rho, \hat{m}_t, \hat{rem}_t$	0.722	0.754	0.758	0.754	0.754	0.754	0.754	0.030	0.069	0.230	0.135	0.135	0.230	0.354
11	$\rho, \hat{m}_t, \hat{sug}_{t-1}$	0.616	0.722	0.682	0.722	0.722	0.722	0.722	0.010	0.069	0.069	0.135	0.135	0.135	0.135
12	$\rho, \hat{s}_{t-1}, \hat{y}_{t-1}^*$	0.398	0.682	0.616	0.682	0.722	0.722	0.722	0.010	0.069	0.135	0.135	0.354	0.354	0.354
13	$\rho, \hat{s}_{t-1}, \hat{rem}_t$	0.000	0.722	0.616	0.682	0.682	0.682	0.682	0.069	0.230	0.135	0.230	0.135	0.135	0.135
14	$\rho, \hat{s}_{t-1}, \hat{sug}_{t-1}$	0.398	0.521	0.616	0.682	0.722	0.722	0.722	0.030	0.000	0.135	0.069	0.230	0.354	0.354
15	$\rho, \hat{s}_{t-1}, \hat{m}_t$	0.260	0.760	0.760	0.760	0.760	0.760	0.760	0.010	0.354	0.494	0.634	0.634	0.758	0.758
16	$\rho, \hat{y}_{t-1}^*, \hat{sug}_{t-1}, \hat{rem}_t$	0.682	0.616	0.521	0.521	0.616	0.682	0.682	0.030	0.030	0.010	0.010	0.010	0.010	0.010
17	$\rho, \hat{m}_t, \hat{y}_{t-1}^*, \hat{rem}_t$	0.743	0.722	0.682	0.682	0.682	0.682	0.722	0.030	0.010	0.069	0.069	0.069	0.069	0.069
18	$\rho, \hat{m}_t, \hat{y}_{t-1}^*, \hat{sug}_{t-1}$	0.616	0.743	0.682	0.743	0.754	0.743	0.743	0.030	0.030	0.135	0.069	0.030	0.030	0.030
19	$\rho, \hat{m}_t, \hat{sug}_{t-1}, \hat{rem}_t$	0.616	0.722	0.743	0.743	0.754	0.754	0.743	0.030	0.069	0.069	0.230	0.230	0.230	0.230
20	$\rho, \hat{s}_{t-1}, \hat{y}_{t-1}^*, \hat{rem}_t$	-0.095	0.521	0.521	0.521	0.616	0.616	0.616	0.030	0.135	0.135	0.230	0.230	0.230	0.230
21	$\rho, \hat{s}_{t-1}, \hat{y}_{t-1}^*, \hat{sug}_{t-1}$	0.260	0.616	0.616	0.682	0.722	0.743	0.743	0.010	0.069	0.230	0.230	0.634	0.494	0.634
22	$\rho, \hat{s}_{t-1}, \hat{sug}_{t-1}, \hat{rem}_t$	0.398	0.521	0.682	0.682	0.682	0.682	0.722	0.135	0.069	0.135	0.069	0.354	0.354	0.354
23	$\rho, \hat{s}_{t-1}, \hat{m}_t, \hat{y}_{t-1}^*$	0.398	0.743	0.722	0.743	0.722	0.722	0.722	0.010	0.354	0.354	0.494	0.354	0.494	0.634
24	$\rho, \hat{s}_{t-1}, \hat{m}_t, \hat{rem}_t$	0.260	0.758	0.754	0.754	0.754	0.758	0.758	0.010	0.634	0.494	0.354	0.354	0.634	0.634
25	$\rho, \hat{s}_{t-1}, \hat{m}_t, \hat{sug}_{t-1}$	0.521	0.616	0.743	0.754	0.754	0.754	0.754	0.000	0.135	0.354	0.494	0.758	0.758	0.758
26	$\rho, \hat{s}_{t-1}, \hat{m}_t, \hat{sug}_{t-1}, \hat{rem}_t$	0.521	0.682	0.754	0.754	0.743	0.743	0.743	0.069	0.230	0.494	0.494	0.853	0.853	0.919
27	$\rho, \hat{s}_{t-1}, \hat{m}_t, \hat{y}_{t-1}^*, \hat{sug}_{t-1}$	0.260	0.682	0.743	0.754	0.754	0.754	0.754	0.000	0.494	0.634	0.853	0.758	0.758	0.853
28	$\rho, \hat{s}_{t-1}, \hat{m}_t, \hat{y}_{t-1}^*, \hat{rem}_t$	0.398	0.616	0.616	0.682	0.682	0.682	0.682	0.030	0.354	0.494	0.494	0.494	0.634	0.634
29	$\rho, \hat{s}_{t-1}, \hat{y}_{t-1}^*, \hat{sug}_{t-1}, \hat{rem}_t$	0.000	0.616	0.682	0.722	0.722	0.722	0.722	0.000	0.230	0.354	0.354	0.230	0.230	0.354
30	$\rho, \hat{m}_t, \hat{y}_{t-1}^*, \hat{sug}_{t-1}, \hat{rem}_t$	0.616	0.682	0.682	0.682	0.743	0.743	0.743	0.030	0.030	0.030	0.030	0.069	0.069	0.069
31	$\rho, \hat{s}_{t-1}, \hat{m}_t, \hat{y}_{t-1}^*, \hat{sug}_{t-1}, \hat{rem}_t$	0.000	0.722	0.754	0.758	0.754	0.754	0.754	0.000	0.230	0.853	0.853	0.853	0.758	0.853

¹ The total number of five variable combinations is 31, where forecasts from the final combination (see the last row) based on a smoothing coefficient of 100 is the benchmark comparison forecast for all the remaining estimations. Therefore, negative (positive) values imply an improvement (worsening) respect to the base forecast.

Numbers in *italics* are negative, although it might be unnoticeable at 3 decimal approximations.