Internet Appendix for

"The Role of the Discount Rate in Investment and Employment Decisions"

This appendix provides additional results for various robustness checks. Below is a brief description of the robustness checks:

- Table A1 reports results obtained when using a simple version of the Hamilton regression filter that emerges if we assume that consumption follows a random walk.
- Table A2 reports results using cyclical consumption extracted using the Hamilton regression filter with a cycle of $k = 6$ years and a lag length specification in the range from 1 to 12 lags.
- Table A3 reports international evidence over the sample period 1980Q1 to 2019Q4.
- Table A4 reports international evidence when controlling for other discount rate proxies.

A. Robustness Tests

A.1 Specification of the Hamilton Filter

In the main body of the paper, we followed the detrending method in Atanasov, Møller, and Priestley (2020) who show that a horizon of six years in the detrending filter along with four lags is consistent with implications of the Campbell and Cochrane (1999) external habit formation model. We also provide evidence in the main body of the paper that the results regarding investment growth and employment growth predictability are robust to alternative specifications of the detrending along dimensions of the horizon and the lag length.

In this part of the appendix, we provide further robustness tests regarding the detrending specification. In particular, we first present results where we assume that consumption follows a random walk and the detrending simply becomes a first difference: $\text{CC}_t = c_t - c_{t-k}$ with $k = 6$ years. Table A1 reports the results and indicates a pattern of predictability of investment and employment growth that is consistent with that provided in the main body of the paper.

The main body of the paper reports results where the number of lags in the Hamilton filter is set to four along with a robustness test that reports results with one, two and three lags. Table A2 extends this robustness test to include long lags in the Hamilton filter. Specifically, we detrend consumption with up to twelve lags. The results regarding the predictability of investment and employment are very similar over different specifications of the number of lags. Table A2 reports results using one lag through to twelve lags and shows that there is little impact on the extent of predictability.

A.2 International Evidence

In the main body of the paper, we report results of the predictability of investment growth and employment growth for a set of non-U.S. countries using quarterly data. For investment growth and stock return predictability, the sample period starts in 1970 and for employment growth it starts in 1980. In order to compare the results from investment and employment predictability over the same sample period, Table A3 reports results for stock return predictability, investment growth predictability, and employment growth predictability using a sample that starts in 1980. The table shows that both stock returns and investment growth are predictable when using a sample that starts in 1980 and that the extent of predictability is very similar to that which was recorded in the sample that starts in 1970.

Finally, in Table A4, we present evidence for the G10 excluding the U.S. that CC is able to predict stock returns, investment growth and employment growth in the presence of the dividend price ratio.

Table A1. Random Walk Assumption

Panel A and B present results from predictive regressions of the h-period ahead log growth in investment and employment, respectively. As predictive variable, we use cyclical consumption under the assumption that consumption follows a random walk such that the Hamilton filter implies that $\text{CC}_t = c_t - c_{t-k}$ with $k = 6$ years. For each regression, the table reports the slope estimate, the Newey-West corrected t-statistic (h lags), and the adjusted R^2 statistic. The regressions are estimated over the period 1953Q4 to 2019Q4.

Panel A: Investment Predictability							
	$h=1$	$h=2$	$h=4$	$h=8$	$h=12$	$h=16$	$h=20$
CC	-0.024	-0.075	-0.253	-0.676	-0.968	-1.098	-1.228
t-stat	-0.880	-1.375	-2.456	-3.051	-2.607	-2.307	-2.297
$\overline{R}^2$	-0.001	0.004	0.028	0.093	0.144	0.163	0.189
Panel B: Employment Predictability							
	$h=1$	$h=2$	$h=4$	$h=8$	$h=12$	$h=16$	$h=20$
CC	0.001	-0.013	-0.070	-0.221	-0.346	-0.443	-0.528
t-stat	0.063	-0.684	-1.858	-2.657	-2.564	-2.437	-2.365
$\overline{R}^2$	-0.004	-0.002	0.016	0.074	0.124	0.160	0.192

Table A2. Lag Length Specification

Panel A and B present results from predictive regressions of the h-period ahead log growth in investment and employment, respectively. As predictive variable, we use cyclical consumption extracted using the Hamilton filter with $k = 6$ years and the lag length p in the range from 1 to 12. For each regression, the table reports the slope estimate, the Newey-West corrected t-statistic (h lags), and the adjusted R^2 statistic. The regressions are estimated over the period 1955Q4 to 2019Q4 across all values of p.

Panel A: Investment Predictability							
	$h=1$	$h=2$	$h=4$	$h=8$	$h=12$	$h=16$	$h=20$
$CC^{p=1}$	-0.029	-0.083	-0.266	-0.721	-1.079	-1.294	-1.451
t-stat	-1.002	-1.400	-2.333	-3.009	-2.761	-2.579	-2.623
$\overline{R}^2$	-0.000	0.006	0.029	0.099	0.168	0.213	0.247
$CC^{p=2}$	-0.029	-0.083	-0.266	-0.722	-1.081	-1.299	-1.457
t-stat	-0.999	-1.399	-2.328	-2.995	-2.756	-2.584	-2.633
$\overline{R}^2$	-0.000	0.006	0.029	0.099	0.168	0.214	0.249
$CC^{p=3}$	-0.029	-0.083	-0.266	-0.723	-1.083	-1.307	-1.464
t-stat	-0.999	-1.413	-2.306	-2.960	-2.734	-2.585	-2.642
$\overline{R}^2$	-0.000	0.006	0.029	0.099	0.168	0.216	0.250
$CC^{p=4}$	-0.030	-0.084	-0.265	-0.723	-1.089	-1.319	-1.473
t-stat	-1.025	-1.406	-2.262	-2.917	-2.719	-2.596	-2.656
$\overline{R}^2$	0.000	0.006	0.029	0.098	0.169	0.218	0.252
$CC^{p=5}$	-0.029	-0.081	-0.261	-0.720	-1.095	-1.330	-1.479
t-stat	-0.975	-1.340	-2.192	-2.855	-2.699	-2.604	-2.662
$\overline{R}^2$	-0.000	0.005	0.027	0.097	0.170	0.221	0.252
$CC^{p=6}$	-0.028	-0.079	-0.260	-0.717	-1.101	-1.337	-1.482
t-stat	-0.922	-1.291	-2.159	-2.812	-2.699	-2.621	-2.679
$\overline{R}^2$	-0.001	0.005	0.027	0.095	0.171	0.223	0.252
$CC^{p=7}$	-0.027	-0.078	-0.260	-0.717	-1.106	-1.343	-1.486
t-stat	-0.903	-1.270	-2.136	-2.790	-2.706	-2.641	-2.704
$\overline{R}^2$	-0.001	0.005	0.027	0.095	0.172	0.224	0.253
$CC^{p=8}$	-0.026	-0.079	-0.258	-0.719	-1.115	-1.348	-1.490
t-stat	-0.866	-1.274	-2.095	-2.770	-2.718	-2.657	-2.725
$\overline{R}^2$	-0.001	0.005	0.027	0.095	0.174	0.225	0.253
$CC^{p=12}$	-0.023	-0.070	-0.251	-0.740	-1.128	-1.346	-1.465
t-stat	-0.724	-1.062	-1.933	-2.720	-2.724	-2.688	-2.785
$\overline{R}^2$	-0.002	0.003	0.024	0.099	0.176	0.220	0.240

Panel B: Employment Predictability							
	$h=1$	$h=2$	$h=4$	$h=8$	$h=12$	$h=16$	$h=20$
$CC^{p=1}$	-0.004	-0.020	-0.081	-0.251	-0.412	-0.554	-0.656
t-stat	-0.375	-1.012	-2.048	-2.840	-2.849	-2.833	-2.766
$\overline{R}^2$	-0.003	0.001	0.022	0.090	0.166	0.234	0.277
$CC^{p=2}$	-0.004	-0.020	-0.082	-0.252	-0.414	-0.557	-0.660
t-stat	-0.391	-1.027	-2.059	-2.844	-2.856	-2.844	-2.779
$\overline{R}^2$	-0.003	0.001	0.022	0.091	0.168	0.236	0.280
$CC^{p=3}$	-0.004	-0.021	-0.082	-0.254	-0.417	-0.562	-0.664
t-stat	-0.415	-1.061	-2.053	-2.846	-2.863	-2.854	-2.789
$\overline{R}^2$	-0.003	0.001	0.022	0.091	0.170	0.239	0.283
$CC^{p=4}$	-0.004	-0.021	-0.082	-0.255	-0.422	-0.568	-0.670
t-stat	-0.459	-1.056	-2.029	-2.850	-2.875	-2.871	-2.800
$\overline{R}^2$	-0.003	0.001	0.022	0.092	0.173	0.244	0.286
$CC^{p=5}$	-0.004	-0.020	-0.081	-0.255	-0.427	-0.574	-0.675
t-stat	-0.396	-0.991	-2.001	-2.830	-2.882	-2.884	-2.800
$\overline{R}^2$	-0.003	0.001	0.021	0.092	0.175	0.247	0.288
$CC^{p=6}$	-0.004	-0.019	-0.082	-0.256	-0.431	-0.579	-0.678
t-stat	-0.362	-0.956	-1.998	-2.833	-2.897	-2.903	-2.812
$\overline{R}^2$	-0.003	0.001	0.022	0.092	0.178	0.250	0.290
$CC^{p=7}$	-0.004	-0.020	-0.082	-0.258	-0.434	-0.583	-0.683
t-stat	-0.363	-0.977	-1.998	-2.842	-2.914	-2.927	-2.836
$\overline{R}^2$	-0.003	0.001	0.022	0.093	0.181	0.254	0.293
$CC^{p=8}$	-0.004	-0.021	-0.083	-0.261	-0.439	-0.587	-0.687
t-stat	-0.434	-1.009	-2.002	-2.854	-2.936	-2.948	-2.855
$\overline{R}^2$	-0.003	0.001	0.022	0.095	0.184	0.256	0.295
$CC^{p=12}$	-0.003	-0.019	-0.085	-0.269	-0.448	-0.592	-0.689
t-stat	-0.282	-0.889	-1.948	-2.773	-2.922	-2.970	-2.868
$\overline{R}^2$	-0.004	0.000	0.023	0.099	0.188	0.256	0.291

Table A3. International Evidence: 1980Q1 to 2019Q4

The table presents results from pooled predictive regressions using cyclical consumption to predict either log returns (Panel A), log investment growth (Panel B), or log employment growth (Panel C). The forecast horizon ranges from one quarter ($h = 1$) to five years ($h = 20$). The cross-section of countries includes the G10 countries except the U.S. The time period is 1980Q1 to 2019Q4. For each regression, the table reports the slope estimate, the associated t-statistic, and the within R^2. Following the procedure of Thompson (2011), the standard errors are robust to heteroskedasticity as well as correlation along both the time and the country dimension.

Panel A: Return Predictability							
	$h = 1$	$h = 2$	$h = 4$	$h = 8$	$h = 12$	$h = 16$	$h = 20$
CC	-0.286	-0.590	-1.141	-1.969	-2.504	-2.738	-2.643
t-stat	-3.314	-3.285	-3.469	-3.573	-3.901	-4.609	-4.513
R^2_{within}	0.020	0.040	0.071	0.107	0.122	0.118	0.096
Panel B: Investment Predictability							
	$h = 1$	$h = 2$	$h = 4$	$h = 8$	$h = 12$	$h = 16$	$h = 20$
CC	-0.006	-0.033	-0.121	-0.370	-0.634	-0.863	-1.018
t-stat	-0.890	-2.021	-3.191	-3.655	-3.443	-3.203	-3.139
R^2_{within}	0.000	0.002	0.011	0.051	0.100	0.147	0.176
Panel C: Employment Predictability							
	$h = 1$	$h = 2$	$h = 4$	$h = 8$	$h = 12$	$h = 16$	$h = 20$
CC	0.008	0.011	0.004	-0.052	-0.133	-0.214	-0.280
t-stat	2.454	1.559	0.235	-1.768	-3.092	-3.313	-3.418
R^2_{within}	0.010	0.006	0.000	0.016	0.062	0.118	0.166

Table A4. International Evidence: Other Discount Rate Proxies

The table presents results from pooled predictive regressions using cyclical consumption (CC) and the dividend-price ratio (DP) to predict either log returns (Panel A), log investment growth (Panel B), or log employment growth (Panel C). The forecast horizon ranges from one quarter ($h = 1$) to five years ($h = 20$). The cross-section of countries includes the G10 countries except the U.S. The time period is 1970Q1 to 2019Q4 for returns and investments (Panel A and B) and 1980Q1 to 2019Q4 for employment (Panel C). For each regression, the table reports the slope estimate, the associated t-statistic, and the within R^2. Following the procedure of Thompson (2011), the standard errors are robust to heteroskedasticity as well as correlation along both the time and the country dimension.

Panel A: Return Predictability							
	$h = 1$	$h = 2$	$h = 4$	$h = 8$	$h = 12$	$h = 16$	$h = 20$
CC	-0.251	-0.511	-1.013	-1.717	-2.184	-2.384	-2.317
t-stat	-3.287	-3.393	-3.671	-4.127	-3.814	-4.070	-4.309
DP	0.023	0.042	0.064	0.112	0.150	0.199	0.238
t-stat	2.357	2.110	1.715	1.769	1.887	2.613	3.048
R^2_{within}	0.027	0.049	0.078	0.116	0.137	0.148	0.142
Panel B: Investment Predictability							
	$h = 1$	$h = 2$	$h = 4$	$h = 8$	$h = 12$	$h = 16$	$h = 20$
CC	-0.018	-0.055	-0.161	-0.431	-0.703	-0.938	-1.094
t-stat	-2.010	-3.064	-4.301	-5.093	-4.529	-4.238	-4.249
DP	-0.004	-0.008	-0.014	-0.024	-0.031	-0.038	-0.043
t-stat	-1.766	-1.668	-1.485	-1.417	-1.742	-2.167	-2.358
R^2_{within}	0.002	0.007	0.024	0.067	0.116	0.161	0.189
Panel C: Employment Predictability							
	$h = 1$	$h = 2$	$h = 4$	$h = 8$	$h = 12$	$h = 16$	$h = 20$
CC	0.006	0.006	-0.006	-0.071	-0.158	-0.240	-0.309
t-stat	1.514	0.820	-0.373	-1.882	-2.582	-2.852	-3.128
DP	-0.001	-0.002	-0.004	-0.008	-0.010	-0.011	-0.012
t-stat	-1.486	-1.458	-1.328	-1.178	-1.124	-1.174	-1.352
R^2_{within}	0.017	0.017	0.014	0.034	0.078	0.132	0.178