Investment-based Costs of Equity

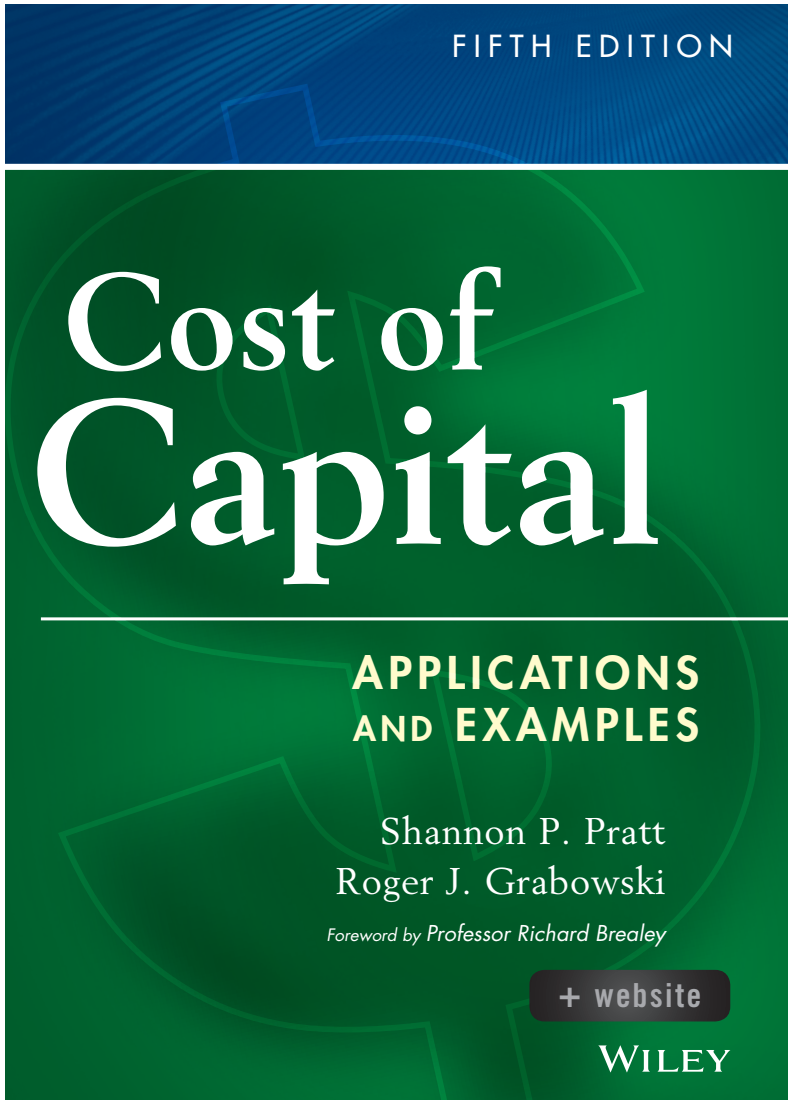
Yicheng Liu[1] Chen Xue[2] Lu Zhang[3]

[1]Ohio State [2]U. of Cincinnati [3]Ohio State and NBER

Iowa State University
April 2, 2026

Theme

The cost of equity problem extremely important for practice



One of the most foundational problems in finance

Most applications depend on a cost of equity estimate

Investment management, business valuation, capital budgeting, financing decision

Trillions of dollars involved

Theme

The cost of equity problem still largely open in academia

The imprecision problem with factor models:

- Fama and French (1997)

Accounting-based implied costs of equity:

- Claus and Thomas (2001); Gebhardt, Lee, and Swaminathan (2001); Easton (2004); Ohlson and Juettner-Nauroth (2005)

The weak association problem:

- Easton and Monahan (2005)

The q^5-characteristics model estimates costs of equity as out-of-sample forecasts from cross-sectional predictive regressions

Size, investment-to-assets, return on equity, and expected growth

Gradient-boosted trees improve on cross-sectional regressions, but not materially or reliably in our context

In portfolio sorts, the q^5-cost of equity (QCE) strongly associated with future returns (the high-minus-low deciles)

h	1m	12m	24m
QCE	1.62	0.81	0.57
	7.29	4.01	2.93

	1m	12m	24m
ICE	−0.03	0.03	0.04
	−0.08	0.10	0.13

	1m	12m	24m
Q5F	0.13	0.32	0.38
	0.57	1.57	1.95

In cross-sectional regressions, the QCE slopes insignificant from 1

	h	s	ste	$\lvert t_{s=1}\rvert$	h	s	ste	$\lvert t_{s=1}\rvert$	h	s	ste	$\lvert t_{s=1}\rvert$
QCE	1	0.82	0.11	1.63	12	0.63	0.15	2.51	24	0.81	0.13	1.47
ICE	1	0.42	0.17	3.45	12	0.51	0.13	3.80	24	0.49	0.09	5.90
Q5F	1	0.01	0.03	35.38	12	0.00	0.02	42.25	24	0.01	0.01	66.00

Theme

QCE underperforms ICE in time series MEV, but competitive in cross-section MEV

	h	$\overline{\text{SVar}}^{\text{TS}}$	Var^{TS}	Cov^{TS}	$\overline{\text{SVar}}^{\text{CX}}$	Var^{CX}	Cov^{CX}
QCE	1	0.0029	0.0072	0.0043	−0.0033	0.0079	0.0112
ICE	1	−0.0198	0.0038	0.0237	0.0015	0.0059	0.0044
Q5F	1	0.0237	0.0202	−0.0035	0.0312	0.0317	0.0004
QCE	12	−0.2009	0.4546	0.6555	−0.1996	0.5234	0.7230
ICE	12	−2.6246	0.7093	3.3340	−0.0644	1.0922	1.1567
Q5F	12	4.3364	3.5564	−0.7801	5.4646	5.4208	−0.0438
QCE	24	−1.8373	1.3018	3.1391	−0.6282	1.6281	2.2563
ICE	24	−8.5829	3.8721	12.46	0.6826	5.6091	4.9265
Q5F	24	23.20	21.96	−1.2398	31.01	31.73	0.7205

Theme

Apply QCE to study firm-, industry-, factor-, and aggregate costs of equity

QCE resolves the imprecision problem

QCE resolves the weak association problem in the cross section

Strong ICE performance in time series predictability

The firm-level QCE distribution weakly left-skewed, whereas the firm-level ICE distribution right-skewed

Outline

Outline

At the beginning of month t, estimate betas from prior 60-month rolling window (30 minimum)

Estimate factor premiums averaged from the expanding window that starts from January 1967

Add back 1-month Treasury bill rate to obtain the cost of equity

Unconditional factor models imply a flat term structure

The internal rate of return from the residual income model

ICE as the equal-weighted average of four ICE variants:

- Claus and Thomas (2001)
- Gebhardt, Lee, and Swaminathan (2001)
- Easton (2004)
- Ohlson and Juettner-Nauroth (2005)

Estimate earnings forecasts via cross-sectional earnings regressions (Hou, van Dijk, and Zhang 2012)

A flat term structure for ICE (the internal rate of return)

Lewellen (2015): A simple, yet effective, measure of expected returns by combining slopes from prior 120-month rolling windows with the latest available characteristics at the beginning of month t

Investment-based out-of-sample forecasts on the q^5-characteristics: size, I/A, ROE, and expected growth (EG)

- EG from cross-sectional forecasts of changes in I/A on Tobin's q, cash-based operating cash flow, and changes in ROE
- For 12-month forecasts, regress cumulative returns from month $t-12$ to $t-1$ on characteristics known at month $t-12$

Estimation

Gradient-boosted trees capture nonlinear relations between the q^5-characteristics and expected returns

A tree sequentially splits stocks based on q^5-characteristics

Boosting mitigates overfitting by combining many shallow trees

Gradient boosting tends to outperform neural nets in tabular data:

- Grinsztajn, Oyallon, and Varoquaux (2022)
- McElfresh et al. (2023)

LightGBM; 120-month rolling window; 5-fold cross-validation; MSE (MAE, Huber); hyperparameters tuning via grid search

Outline

Portfolio sorts: Simplest way to check association with cross-sectional returns

Test slope $= 1$ in cross-sectional predictive regressions (Lewellen 2015): Test for bias (if large-sample average returns are unbiased)

Bias clearly important for business valuation and capital budgeting

For treatment effects (how differences in corporate polices are related to differences in CE), the CE bias largely irrelevant

Measurement error variance most relevant for treatment effects

The measurement error: $\omega_{it} = \widehat{er}^h_{it} - er^h_{it}$:

- er^h_{it}: Firm i's true h-month ahead expected return at the beginning of month t
- $\widehat{er}^h_{it}$: An empirical proxy of er^h_{it}

ω_{it} differs from the forecast error, $\widehat{e}_{it+h} \equiv r_{it+h} - \widehat{er}^h_{it}$

Time series and cross-section MEV: Very clever in avoiding the unobservable er_{it}

Time series MEV:

$$\begin{aligned}\overline{\text{SVar}}^{\text{TS}} &= \frac{1}{N}\sum_i \text{SVar}_i^{\text{TS}} \\ \text{SVar}_i^{\text{TS}} &= \text{Var}_i\left(\widehat{er}_{it}^{h}\right) - 2\text{Cov}_i\left(\widehat{er}_{it}^{h}, r_{it+h}\right)\end{aligned}$$

Cross-section MEV:

$$\begin{aligned}\overline{\text{SVar}}^{\text{CX}} &= \frac{1}{T^P - h}\sum_t \text{SVar}_t^{\text{CX}} \\ \text{SVar}_t^{\text{CX}} &= \text{Var}_t\left(\widehat{er}_{it}^{h}\right) - 2\text{Cov}_t\left(\widehat{er}_{it}^{h}, r_{it+h}\right)\end{aligned}$$

Scaled: $\text{Var}(\omega_{it}) = \text{Var}(\widehat{er}_{it}) - 2\text{Cov}(r_{it+1}, \widehat{er}_{it}) + \text{Var}(er_{it})$

h	1	2	3	4	5	6	7	8	9	10	H−L
QCE (the q^5-characteristics model via cross-sectional regressions)											
1	0.15	0.59	0.69	0.88	0.90	0.98	1.10	1.05	1.28	1.77	1.62
	0.53	2.81	3.60	4.67	4.54	4.84	4.97	4.41	5.52	6.57	7.29
3	0.19	0.59	0.66	0.82	0.89	0.99	0.92	1.07	1.17	1.56	1.37
	0.68	2.75	3.39	4.34	4.49	5.06	4.14	4.95	5.18	6.08	6.46
12	0.45	0.75	0.80	0.88	0.91	0.90	0.95	1.00	1.12	1.26	0.81
	1.98	3.92	4.09	4.33	4.43	4.18	4.13	4.11	4.37	4.17	4.01
24	0.51	0.68	0.82	0.83	0.87	0.96	0.99	1.05	1.17	1.08	0.57
	2.41	3.76	4.03	4.08	4.10	4.25	4.21	4.22	4.34	3.45	2.93
36	0.65	0.72	0.75	0.78	0.83	0.82	0.89	0.87	0.92	0.91	0.26
	3.11	3.82	3.61	3.72	3.78	3.69	3.76	3.48	3.54	3.11	1.54
60	0.68	0.79	0.77	0.74	0.78	0.83	0.84	0.85	0.88	0.69	0.01
	3.28	4.04	3.79	3.36	3.52	3.69	3.58	3.54	3.50	2.50	0.07

h	1	2	3	4	5	6	7	8	9	10	H−L
QCE-GB (the q^5-characteristics model via gradient boosting)											
1	−0.21	0.34	0.60	0.41	0.66	0.78	0.85	0.98	1.23	1.59	1.79
	−0.63	1.28	2.64	2.06	3.34	4.10	4.63	4.83	5.42	5.88	7.02
3	−0.12	0.37	0.47	0.63	0.65	0.78	0.91	1.04	1.20	1.54	1.66
	−0.34	1.44	2.09	3.06	3.36	4.07	4.67	5.04	5.17	5.46	6.17
12	0.32	0.49	0.58	0.75	0.74	0.74	0.83	0.97	1.13	1.20	0.88
	1.07	2.01	2.74	3.93	3.88	3.95	4.43	4.83	4.61	3.80	3.89
24	0.43	0.61	0.72	0.65	0.65	0.72	0.77	0.86	0.97	0.98	0.55
	1.61	2.75	3.58	3.30	3.34	3.75	3.99	4.15	4.00	3.15	3.03
36	0.58	0.66	0.73	0.73	0.69	0.70	0.72	0.73	0.76	0.78	0.20
	2.20	3.05	3.64	3.82	3.65	3.67	3.66	3.51	3.25	2.91	1.16
60	0.71	0.75	0.77	0.80	0.76	0.76	0.79	0.76	0.72	0.66	−0.06
	2.74	3.53	3.84	4.09	3.85	3.91	3.93	3.66	3.36	2.66	−0.34

h	1	2	3	4	5	6	7	8	9	10	H−L
LCE (the Lewellen 7-variable model)											
1	0.39	0.73	0.88	0.75	0.89	0.96	1.07	1.10	1.23	1.48	1.09
	1.64	3.71	4.80	4.12	4.81	4.69	4.31	4.51	4.35	4.12	3.71
3	0.33	0.65	0.76	0.83	0.87	0.98	0.97	1.09	1.12	1.24	0.91
	1.41	3.37	4.20	4.66	4.66	4.80	4.36	4.32	3.91	3.61	3.32
12	0.59	0.83	0.80	0.85	0.87	0.85	0.95	0.99	0.96	0.97	0.38
	2.52	4.57	4.55	4.61	4.57	4.20	4.27	3.92	3.26	2.78	1.42
24	0.63	0.78	0.80	0.80	0.78	0.85	0.91	0.95	1.00	1.04	0.41
	2.66	4.31	4.57	4.40	4.12	4.19	4.14	3.86	3.57	3.24	1.64
36	0.64	0.80	0.80	0.79	0.82	0.80	0.84	0.86	0.93	0.95	0.31
	2.67	4.30	4.47	4.19	4.21	3.96	3.87	3.70	3.61	3.32	1.31
60	0.73	0.86	0.86	0.84	0.77	0.76	0.77	0.75	0.79	0.79	0.06
	3.10	4.37	4.60	4.40	3.99	3.79	3.65	3.29	3.16	2.91	0.28

h	1	2	3	4	5	6	7	8	9	10	H−L
ICE (the accounting-based implied cost of equity)											
1	0.79	0.58	0.68	0.72	0.70	0.69	0.77	0.75	0.83	0.75	−0.03
	2.98	2.90	3.76	4.05	4.01	3.92	3.89	3.28	2.87	1.65	−0.08
3	0.80	0.63	0.64	0.70	0.70	0.68	0.75	0.74	0.89	0.64	−0.16
	3.07	3.11	3.53	3.99	4.10	3.77	4.01	3.24	3.26	1.50	−0.43
12	0.75	0.63	0.72	0.70	0.76	0.76	0.73	0.75	0.95	0.78	0.03
	2.90	3.24	3.98	4.03	4.56	4.44	3.98	3.50	3.77	2.06	0.10
24	0.73	0.67	0.76	0.73	0.77	0.78	0.78	0.79	0.95	0.76	0.04
	2.87	3.50	4.20	4.31	4.67	4.69	4.44	3.95	4.01	2.27	0.13
36	0.75	0.70	0.76	0.74	0.76	0.77	0.78	0.77	0.94	0.70	−0.05
	2.98	3.64	4.23	4.37	4.64	4.66	4.56	4.02	4.17	2.25	−0.18
60	0.79	0.73	0.77	0.75	0.75	0.75	0.74	0.75	0.85	0.71	−0.09
	3.21	3.80	4.32	4.44	4.54	4.48	4.40	4.16	4.04	2.46	−0.39

h	1	2	3	4	5	6	7	8	9	10	H−L
					Q5F (the q^5-factor model)						
1	0.71	0.76	0.66	0.64	0.65	0.66	0.81	0.76	0.89	0.84	0.13
	2.24	2.89	3.03	3.31	3.88	3.75	4.31	3.77	4.09	2.93	0.57
3	0.67	0.84	0.62	0.68	0.64	0.71	0.78	0.78	0.85	0.86	0.19
	2.11	3.14	2.85	3.58	3.75	4.16	4.25	3.96	3.89	2.99	0.83
12	0.67	0.75	0.61	0.66	0.64	0.69	0.76	0.83	0.90	0.99	0.32
	2.14	2.94	2.90	3.67	3.78	4.16	4.25	4.35	4.09	3.54	1.57
24	0.70	0.71	0.58	0.65	0.66	0.66	0.76	0.81	0.93	1.08	0.38
	2.28	2.95	2.90	3.66	3.96	3.99	4.36	4.29	4.17	3.85	1.95
36	0.76	0.67	0.58	0.64	0.67	0.68	0.75	0.79	0.95	1.08	0.32
	2.59	2.86	2.97	3.71	4.12	4.11	4.37	4.22	4.21	3.82	1.72
60	0.85	0.67	0.61	0.65	0.68	0.68	0.72	0.77	0.94	1.03	0.18
	3.02	2.95	3.21	3.80	4.25	4.16	4.26	4.14	4.04	3.64	1.08

Evaluation

Cross-sectional predictive regressions, detailed evidence

	h	s	ste	$\lvert t_{s=1} \rvert$	h	s	ste	$\lvert t_{s=1} \rvert$	h	s	ste	$\lvert t_{s=1} \rvert$
QCE	1	0.82	0.11	1.63	12	0.63	0.15	2.51	36	0.61	0.13	3.10
QCE-GB	1	1.23	0.09	2.51	12	0.80	0.16	1.28	36	0.69	0.14	2.26
LCE	1	0.81	0.11	1.76	12	0.70	0.15	2.01	36	0.60	0.16	2.51
ICE	1	0.42	0.17	3.45	12	0.51	0.13	3.80	36	0.38	0.07	9.10
Q5F	1	0.01	0.03	35.38	12	0.00	0.02	42.25	36	0.01	0.01	90.11
QCE	3	0.81	0.13	1.54	24	0.81	0.13	1.47	60	0.54	0.16	2.92
QCE-GB	3	1.07	0.14	0.55	24	0.94	0.14	0.41	60	0.51	0.13	3.70
LCE	3	0.77	0.12	1.83	24	0.72	0.14	2.05	60	0.57	0.18	2.33
ICE	3	0.33	0.15	4.35	24	0.49	0.09	5.90	60	0.29	0.06	12.18
Q5F	3	0.00	0.03	34.41	24	0.01	0.01	66.00	60	0.00	0.00	203.77

	h	$\overline{\text{SVar}}^{\text{TS}}$	Var^{TS}	Cov^{TS}	$\overline{\text{SVar}}^{\text{CX}}$	Var^{CX}	Cov^{CX}
QCE	1	0.0029	0.0072	0.0043	−0.0033	0.0079	0.0112
QCE-GB	1	−0.0063	0.0049	0.0112	−0.0071	0.0052	0.0123
LCE	1	0.0012	0.0051	0.0039	−0.0038	0.0062	0.0100
ICE	1	−0.0198	0.0038	0.0237	0.0015	0.0059	0.0044
Q5F	1	0.0237	0.0202	−0.0035	0.0312	0.0317	0.0004
QCE	3	0.0306	0.0541	0.0236	−0.0239	0.0571	0.0811
QCE-GB	3	−0.0162	0.0365	0.0527	−0.0419	0.0377	0.0796
LCE	3	0.0381	0.0429	0.0048	−0.0233	0.0473	0.0706
ICE	3	−0.1618	0.0357	0.1975	0.0205	0.0558	0.0353
Q5F	3	0.2317	0.1861	−0.0456	0.2927	0.2904	−0.0022
QCE	12	−0.2009	0.4546	0.6555	−0.1996	0.5234	0.7230
QCE-GB	12	−0.4339	0.3363	0.7702	−0.3843	0.3621	0.7464
LCE	12	−0.3560	0.4758	0.8318	−0.2228	0.5898	0.8126
ICE	12	−2.6246	0.7093	3.3340	−0.0644	1.0922	1.1567
Q5F	12	4.3364	3.5564	−0.7801	5.4646	5.4208	−0.0438

	h	$\overline{\text{SVar}}^{\text{TS}}$	Var^{TS}	Cov^{TS}	$\overline{\text{SVar}}^{\text{CX}}$	Var^{CX}	Cov^{CX}
QCE	24	−1.8373	1.3018	3.1391	−0.6282	1.6281	2.2563
QCE-GB	24	−2.2231	0.9961	3.2193	−1.0816	1.0918	2.1734
LCE	24	−3.2462	1.6852	4.9314	−1.1976	2.1540	3.3516
ICE	24	−8.5829	3.8721	12.4551	0.6826	5.6091	4.9265
Q5F	24	23.20	21.96	−1.2398	31.01	31.73	0.7205
QCE	36	−1.3427	2.6343	3.9770	−0.2653	3.1630	3.4283
QCE-GB	36	−1.1691	2.1457	3.3148	−0.9205	2.1069	3.0274
LCE	36	−3.7170	3.8659	7.5829	−1.5122	4.6619	6.1741
ICE	36	−12.66	14.04	26.70	7.97	18.47	10.50
Q5F	36	93.20	93.69	0.4880	122.04	125.04	2.9978
QCE	60	−5.8606	7.9166	13.78	1.6146	9.6297	8.0151
QCE-GB	60	−4.0086	6.8684	10.88	−0.1898	6.7147	6.9045
LCE	60	−7.9222	11.80	19.72	0.3232	13.91	13.58
ICE	60	29.93	139.00	109.07	89.28	141.05	51.77
Q5F	60	1501.82	1496.04	−5.7771	1735.74	1730.84	−4.9075

QCE best performer in sorts and cross-sectional regressions

QCE underperforms ICE in time series MEV but competitive in cross-section MEV

Factor models perform poorly, motivating the q^5-characteristics model (for the purpose of estimating costs of equity)

Gradient-boosted trees improve on cross-sectional regressions, but not materially or reliably

Outline

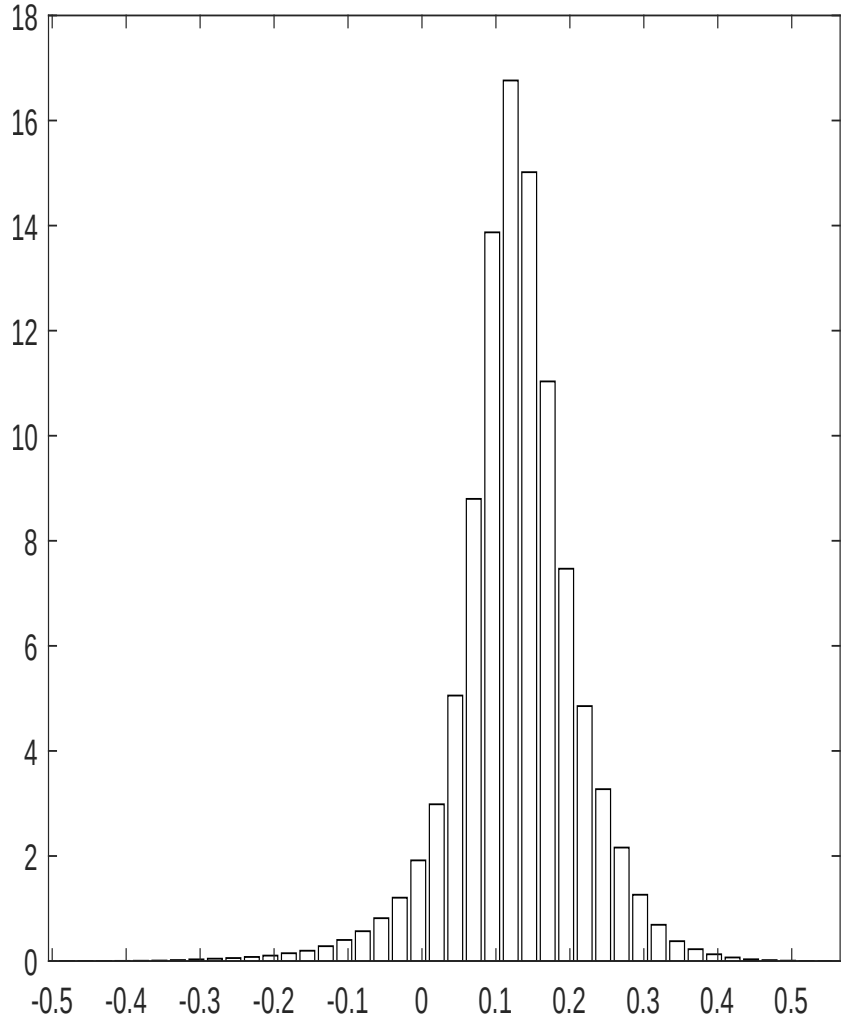
QCE

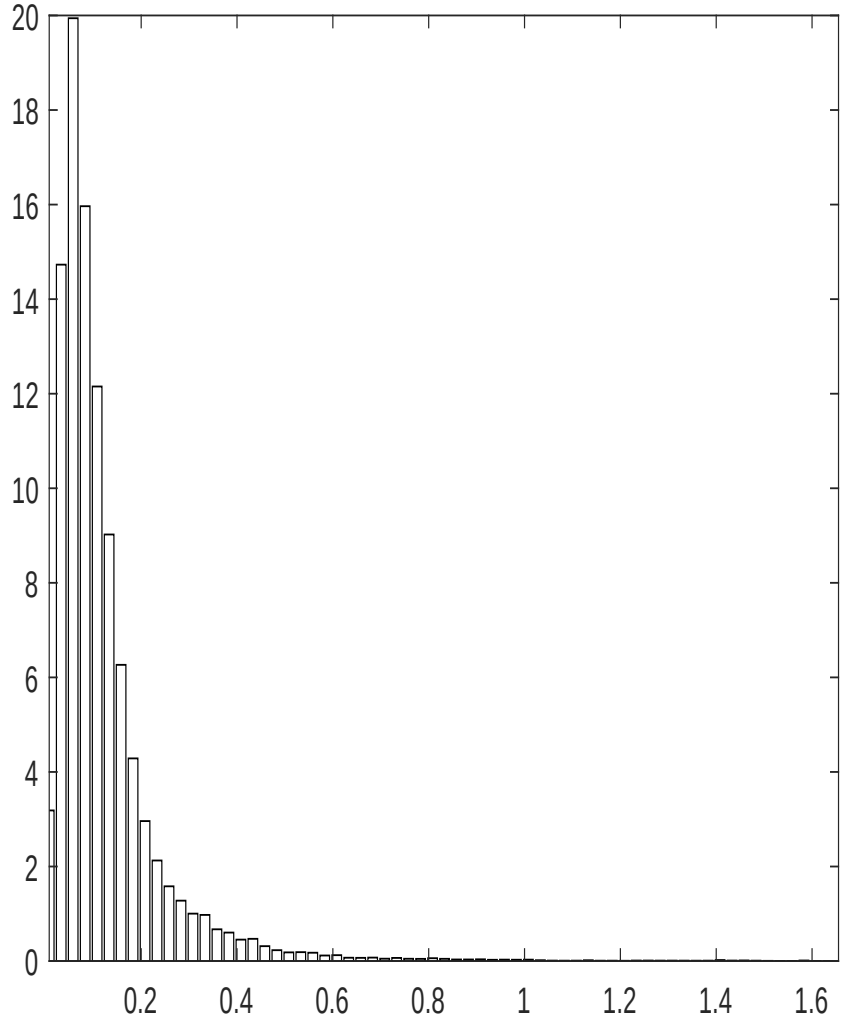
Firm-level costs of equity, January 1977–December 2024

h	Mean	Std	Skew	Kurt	ρ	p5	p25	p50	p75	p95
					QCE					
1	13.83	10.75	−0.81	2.51	0.91	−6.18	9.17	14.77	19.96	29.23
3	13.69	9.55	−0.90	2.53	0.92	−4.51	9.72	14.73	19.18	27.00
12	13.85	6.85	−0.71	2.08	0.93	1.51	10.44	14.34	18.07	23.83
24	13.50	5.42	−0.74	2.33	0.94	4.02	10.64	13.87	16.92	21.44
36	13.03	4.48	−0.76	2.23	0.95	5.13	10.59	13.36	15.90	19.64
60	12.96	3.50	−0.60	2.34	0.95	6.77	10.98	13.22	15.26	18.12
					ICE					
12	13.62	10.26	1.91	3.68	0.97	4.72	7.33	10.14	15.44	38.25
					QCE_{12}-minus-ICE					
12	1.17	11.07	−1.50	3.80	0.95	−22.39	−1.77	3.81	7.67	13.04

QCE

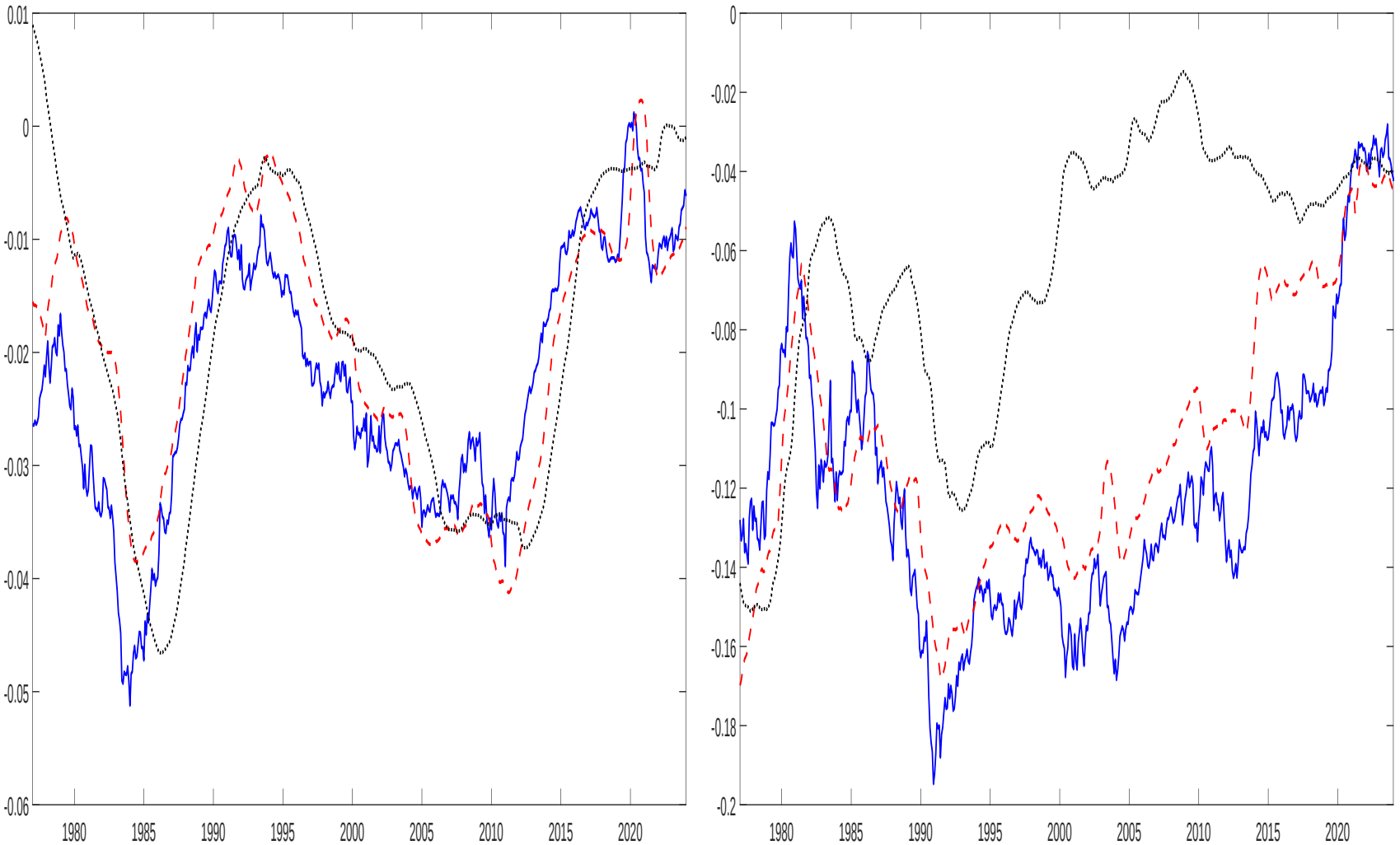
Firm-level costs of equity, 12-month QCE vs. ICE (panel skewness: -0.48 vs. 4.16)





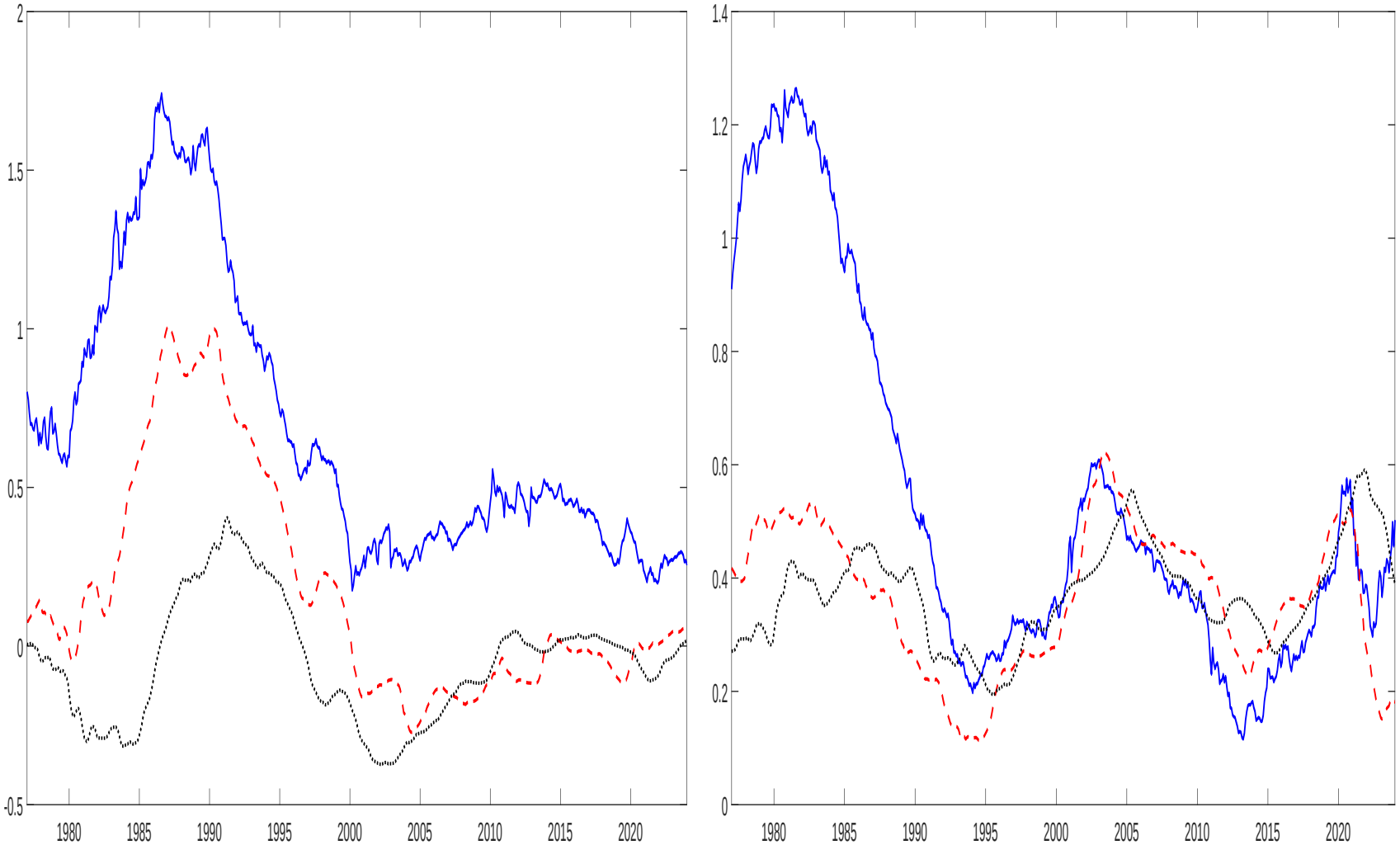
QCE

120-month rolling window slopes in cross-sectional regressions of 1- (blue, $\times 12$), 12- (red), and 36-month (black, /3) ahead returns underlying the QCE estimates, log ME and I/A, 1977/1–2024/12



QCE

120-month rolling window slopes in cross-sectional regressions of 1- (blue, $\times 12$), 12- (red), and 36-month (black, /3) ahead returns underlying the QCE estimates, ROE and EG, 1977/1–2024/12



QCE

Industry costs of equity, January 1977–December 2024: 18 nonfinancial sectors and 57 nonfinancial industries per NAICS

	QCE_1	QCE_3	QCE_{12}	QCE_{24}	QCE_{36}	QCE_{60}	ICE	Q5F	AR
					Sector costs of equity				
Mean	10.21	10.83	9.66	9.51	9.54	9.77	8.57	9.73	13.66
Std	4.27	4.12	4.12	3.79	3.65	3.72	2.82	7.73	21.03
					Industry costs of equity				
Mean	10.75	11.34	10.33	10.12	10.09	10.26	9.04	10.29	13.85
Std	5.10	4.86	4.40	3.92	3.77	3.80	3.37	9.94	25.94

h	1m	3m	12m	24m	36m	60m
	Average realized returns					
I/A, 1−10	0.18	0.62	1.32	0.52	−2.38	−15.86
	0.90	1.04	0.62	0.15	−0.45	−1.51
R11, 10−1	0.98	2.55	4.38	−0.01	5.74	14.44
	3.19	2.71	1.39	0.00	0.88	1.34
ROE, 10−1	0.80	1.94	4.00	6.99	10.74	19.96
	3.25	2.72	1.73	1.99	2.28	2.64
EG, 10−1	0.99	2.94	9.56	17.65	26.96	52.83
	5.38	5.50	4.85	5.16	5.18	5.34

QCE

Factor premiums, January 1977–December 2024

h	1m	3m	12m	24m	36m	60m
	Average QCEs					
I/A, 1−10	0.72	2.18	7.72	12.10	14.78	17.43
	13.05	14.33	14.54	13.56	12.99	8.88
R11, 10−1	0.39	1.00	1.03	0.14	−1.39	−6.40
	7.37	6.70	2.21	0.19	−1.33	−3.21
ROE, 10−1	1.27	3.17	3.79	2.53	0.54	−6.74
	13.29	10.91	3.75	1.68	0.28	−2.94
EG, 10−1	1.43	3.88	9.28	15.43	20.68	28.33
	14.11	14.25	11.98	11.62	12.57	8.20

h	1m	3m	12m	24m	36m	60m
	Average ICEs					
I/A, 1−10	0.24	0.74	3.23	7.29	12.42	27.49
	14.20	14.13	13.78	13.24	12.60	10.96
R11, 10−1	−0.35	−1.07	−4.71	−10.74	−18.54	−42.74
	−10.97	−10.92	−10.68	−10.28	−9.76	−8.36
ROE, 10−1	−0.27	−0.83	−3.66	−8.40	−14.59	−33.62
	−12.73	−12.67	−12.37	−11.89	−11.33	−9.90
EG, 10−1	−0.14	−0.44	−1.96	−4.48	−7.78	−17.99
	−6.32	−6.34	−6.43	−6.54	−6.62	−6.67

QCE

Predicting factor premiums, January 1977–December 2024

h	s	t	R^2	s	t	R^2	s	t	R^2	s	t	R^2
	QCE			ICE			QCE			ICE		
			I/A						R^{11}			
1	1.409	2.879	2.7	1.402	1.148	0.3	0.400	0.617	0.0	4.161	2.353	2.1
3	1.234	2.510	5.1	1.478	1.268	0.8	1.200	1.769	1.1	4.910	2.560	8.5
12	1.107	2.228	8.2	1.544	1.850	3.2	2.101	1.926	6.5	4.498	4.328	28.0
24	0.666	1.364	3.0	0.598	1.047	1.0	2.520	2.362	9.7	3.241	4.980	32.3
36	0.549	1.131	1.7	0.201	0.697	0.2	0.866	0.999	1.7	1.799	6.485	27.3
60	−0.373	−0.587	0.6	0.052	0.302	0.0	0.735	0.941	1.7	0.922	5.505	18.6
			ROE						EG			
1	0.423	1.367	0.3	2.488	1.365	0.7	0.129	0.530	0.0	2.109	1.974	0.7
3	0.409	1.314	0.8	2.935	1.849	2.5	0.220	0.822	0.3	1.808	1.849	1.6
12	0.593	2.211	4.2	2.256	2.538	6.7	0.197	0.541	0.4	2.547	3.345	11.1
24	0.788	2.538	8.3	1.655	3.659	10.1	0.319	1.153	1.2	1.518	2.306	8.3
36	0.580	1.525	4.0	1.195	2.740	10.0	0.177	0.569	0.3	0.937	1.487	4.6
60	1.200	2.882	11.8	0.760	4.282	12.0	0.520	1.307	3.2	0.746	1.252	3.8

QCE

The equity premium, January 1977–December 2024

		1m	3m	12m	24m	36m	60m
QCE	mean	5.69	6.62	4.35	3.96	4.01	3.93
	std	5.22	4.78	4.52	4.52	4.72	5.07
ICE	mean	4.14	4.19	3.75	3.56	3.46	3.31
	std	2.54	2.38	2.40	2.29	2.18	1.99
EAR	mean	7.31	7.20	6.39	5.80	5.37	5.30
	std	4.56	4.48	4.98	5.18	5.46	5.56
Rf	mean	4.29	4.25	4.72	4.97	5.13	5.42
	std	3.70	3.50	3.76	3.74	3.67	3.53

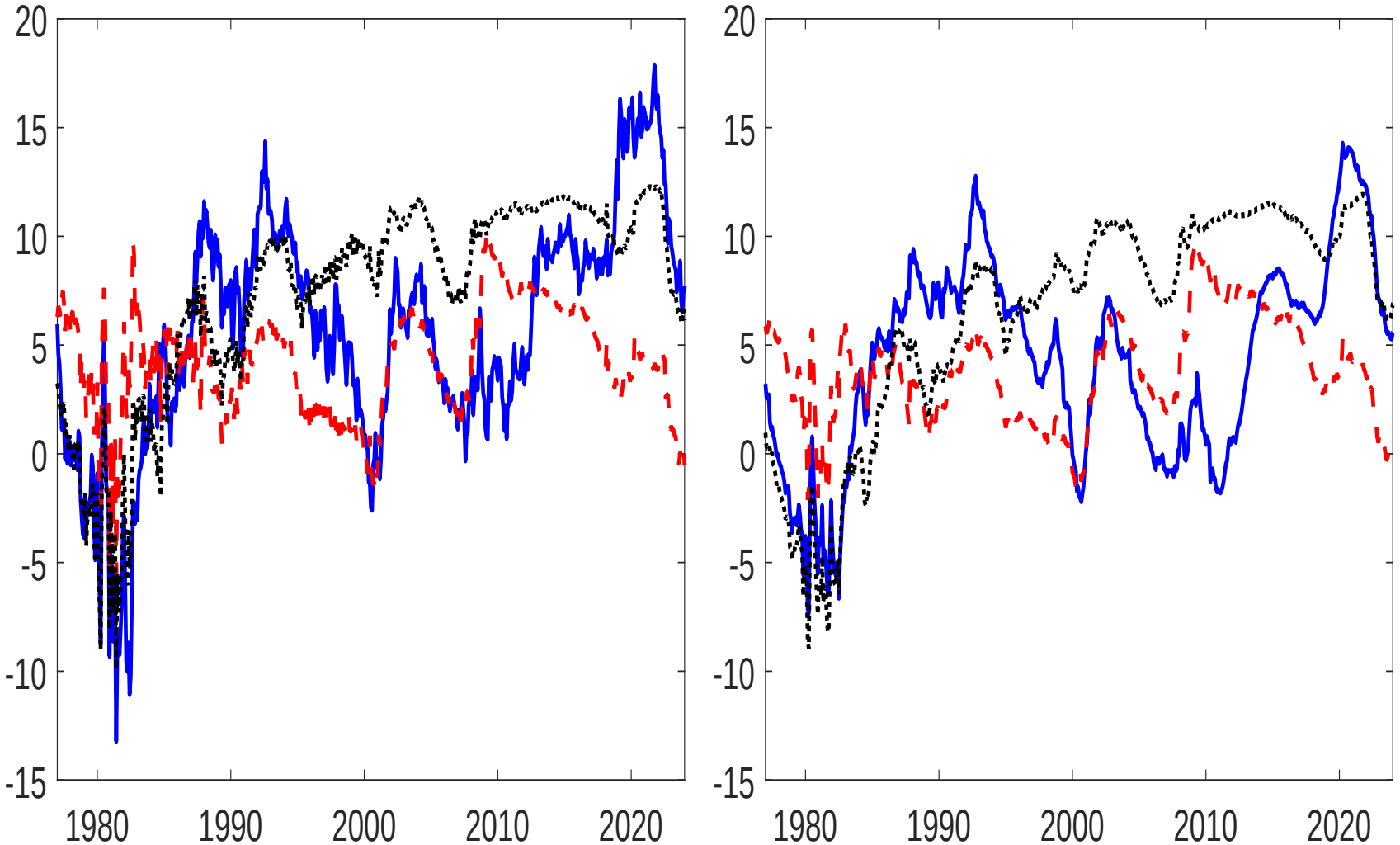
QCE

Predicting the equity premium, January 1977–December 2024

	QCE					ICE				
h	s	t	R^2	Oos-R^2	$\overline{\text{SVar}}^{\text{TS}}$	s	t	R^2	Oos-R^2	$\overline{\text{SVar}}^{\text{TS}}$
1	0.501	1.064	0.2	−0.1	0.000	2.510	2.500	1.3	0.1	−0.002
3	0.345	0.648	0.2	0.0	0.004	1.935	1.997	2.0	0.3	−0.009
12	0.662	1.363	3.2	1.7	−0.067	1.781	2.390	6.3	2.2	−0.145
24	0.558	1.921	5.1	2.5	−0.112	1.731	2.592	11.3	5.3	−0.550
36	0.381	2.087	3.8	3.6	0.617	1.864	3.026	17.8	11.2	−1.399
60	0.037	0.187	0.1	−1.0	10.518	1.995	4.492	24.5	18.8	−4.849

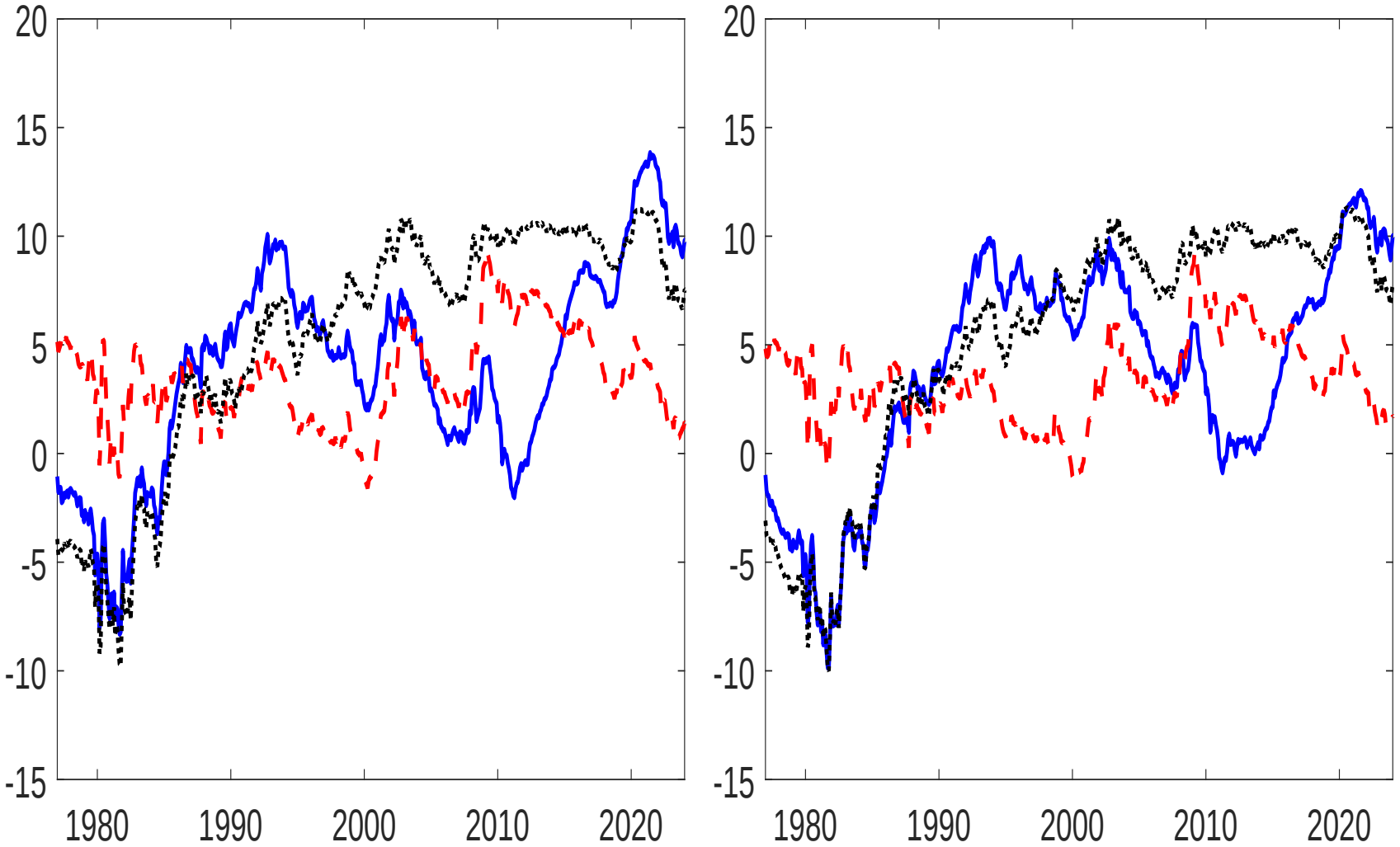
QCE

The Equity Premium, January 1977–December 2024;
QCE (blue), ICE (red), expanding window averages (black); 1- and 12-month



QCE

The Equity Premium, January 1977–December 2024;
QCE (blue), ICE (red), expanding window averages (black); 36- and 60-month



The q^5-characteristics model estimates costs of equity as out-of-sample forecasts from cross-sectional predictive regressions