Internet Appendix to "Growth Opportunities and Technology Shocks"

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Summary

Here, we include material supplementary to the paper. We include several additional descriptive statistics, robustness tests, and results under alternative specifications.

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Table IA.I
Portfolio Transition Probabilities: 5 Portfolios sorted on β^{imc}

The table compares the transition probabilities across IMC beta portfolio quintiles in the data (Panel A) versus the model (Panel B). Stocks are sorted into five portfolios based on β^{imc}_{t-1}. β^{imc}_{t} refers to the firm's beta with the investment-minus-consumption portfolio (IMC) in year t, estimated using non-overlapping weekly returns within year t.

Panel A. Data

		IMC beta sort(t-1)				
		Lo	2	3	4	Hi
Sort(t)	Lo	30.4%	23.1%	18.8%	15.0%	12.5%
	2	24.2%	25.2%	23.1%	18.7%	11.7%
	3	18.7%	23.3%	22.6%	22.3%	14.7%
	4	15.1%	17.9%	21.9%	24.3%	21.7%
	Hi	11.7%	10.5%	13.6%	19.7%	39.5%

Panel B. Model

		IMC beta sort(t-1)				
		Lo	2	3	4	Hi
Sort(t)	Lo	49.1%	28.3%	14.4%	6.2%	1.9%
	2	27.6%	32.6%	24.4%	12.0%	3.4%
	3	14.0%	23.8%	30.7%	23.7%	8.0%
	4	6.4%	11.4%	22.8%	36.6%	22.9%
	Hi	2.7%	3.7%	7.7%	21.4%	63.6%

Table IA.II
IST Risk Exposures

The table reports stock return exposures of the 10 IMC beta and 10 B/M portfolios to the four proxies for the IST shock. R^{imc} is returns to the investment-minus consumption portfolio. Δz^I is the first difference of the de-trended log quality-adjusted relative price of investment goods. Δic is the change in the log aggregate investment-to-consumption ratio. R^{imc} is the return on the IMC portfolio. $-R^{hml}$ is the negative of the returns on the HML portfolio, constructed excluding firms producing investment goods. The sample covers the 1964 to 2008 period. See the main text and the Appendix for details.

Panel A. IMC beta portfolios												
β^{imc} decile	Lo	2	3	4	5	6	7	8	9	Hi	Hi - Lo	9-2
Δz^I	-3.41	-2.80	-2.60	-2.37	-2.77	-3.18	-1.67	-2.47	-1.38	-0.51	2.90	1.43
	(-2.36)	(-2.37)	(-2.60)	(-2.59)	(-2.13)	(-2.29)	(-1.02)	(-1.50)	(-0.67)	(-0.19)	(1.97)	(1.24)
Δic	0.23	-0.45	-0.39	-0.37	-0.32	-0.37	-0.18	-0.41	0.15	0.38	0.16	0.61
	(0.45)	(-0.87)	(-0.80)	(-0.88)	(-0.56)	(-0.66)	(-0.33)	(-0.70)	(0.19)	(0.43)	(0.24)	(1.49)
R_{imc}	-0.06	-0.01	-0.01	-0.00	0.22	0.27	0.55	0.60	1.11	1.51	1.57	1.11
	(-0.45)	(-0.05)	(-0.13)	(-0.03)	(2.19)	(1.96)	(5.85)	(3.13)	(10.81)	(12.56)	(16.98)	(20.52)
$-R_{hml}$	-0.31	-0.01	-0.06	-0.02	0.14	0.07	0.45	0.45	0.84	1.17	1.48	0.84
	(-1.44)	(-0.02)	(-0.30)	(-0.09)	(0.55)	(0.25)	(1.59)	(1.65)	(1.81)	(2.15)	(3.08)	(2.12)
Panel B. Book-to-market portfolios												
BE/ME decile	Lo	2	3	4	5	6	7	8	9	Hi	Hi - Lo	9-2
Δz^I	-2.36	-2.14	-2.41	-2.60	-2.47	-3.38	-3.05	-3.30	-3.62	-3.35	-0.99	-1.48
	(-1.64)	(-1.62)	(-1.51)	(-2.09)	(-2.16)	(-1.99)	(-2.24)	(-2.26)	(-2.91)	(-2.24)	(-1.34)	(-2.16)
Δic	-0.40	-0.30	-0.37	-0.39	-0.54	-0.27	-0.10	-0.29	-0.20	-0.54	-0.14	0.10
	(-0.67)	(-0.50)	(-0.73)	(-0.85)	(-1.29)	(-0.57)	(-0.20)	(-0.55)	(-0.31)	(-1.01)	(-0.34)	(0.35)
R_{imc}	0.41	0.23	0.23	0.19	0.10	0.03	0.02	0.01	0.07	0.19	-0.22	-0.16
	(3.28)	(2.37)	(1.68)	(1.60)	(0.75)	(0.28)	(0.14)	(0.04)	(0.46)	(1.60)	(-2.58)	(-1.30)
$-R_{hml}$	0.72	0.38	0.21	0.07	-0.13	-0.24	-0.44	-0.39	-0.53	-0.61	-1.34	-0.91
	(3.06)	(1.80)	(0.83)	(0.30)	(-0.53)	(-1.01)	(-1.65)	(-1.57)	(-1.80)	(-1.88)	(-6.32)	(-7.37)

Table IA.III
Comovement in Firm Investment and Market Returns

Columns (1) to (3) show estimates of regressing firm investment rates on lagged accumulated log market portfolio returns, $\tilde{R}_t^{mkt} = R_t^{mkt} + R_{t-1}^{mkt}$, across market beta quintiles. All variables have been standardized to zero mean and unit standard deviation. We report t-statistics in parentheses using standard errors clustered by firm and year. Depending on the specification, we include a vector of controls that includes firm-fixed effects and lagged values of log Tobin's Q, cash flows over lagged capital, log book equity over book assets, and log capital.

	(1)	(2)	(3)	(4)	(5)	(6)
$\tilde{R}_{t-1}^{mkt}$	0.076	0.057	0.042	0.023	0.023	0.047
		(3.57)	(3.86)	(0.80)	(1.27)	(3.51)
$D(\beta_{mkt})_2 \times (\tilde{R}_{t-1}^{mkt})$		-0.013	-0.009	-0.008	-0.008	-0.005
		(-1.34)	(-1.30)	(-0.94)	(-1.28)	(-0.62)
$D(\beta_{mkt})_3 \times (\tilde{R}_{t-1}^{mkt})$		-0.008	-0.002	-0.003	-0.002	-0.003
		(-0.88)	(-0.38)	(-0.30)	(-0.22)	(-0.30)
$D(\beta_{mkt})_4 \times (\tilde{R}_{t-1}^{mkt})$		-0.005	0.004	-0.001	0.004	0.009
		(-0.34)	(0.32)	(-0.04)	(0.31)	(0.71)
$D(\beta_{mkt})_H \times (\tilde{R}_{t-1}^{mkt})$		0.025	0.027	0.031	0.020	0.027
		(1.47)	(2.09)	(1.61)	(1.70)	(1.49)
Observations	87749	87749	87749	87749	87749	87749
R^2	0.013	0.039	0.333	0.241	0.411	0.537
Industry/Firm FE	N	N	N	I	I	F
Controls (i_{t-1})	N	N	Y	N	Y	N
Controls ($Q_{t-1}, CF_{t-1}, K_{t-1}, E_{t-1}/A_{t-1}$)	N	N	N	Y	Y	Y

Table IA.IV
Comovement in Firm Investment, Firms with Credit Ratings

The table shows estimates of equation (34) in the main text, where we constrain the sample to firms with a Standard and Poor's credit rating. See the main text and notes to Tables V and VI for more details.

	(1)	(2)	(3)	(4)	(5)	(6)
$\tilde{R}^{imc}_{t-1}$	0.1125	0.0206	0.0302	0.0406	0.0425	0.0547
	(3.00)	(0.97)	(1.86)	(1.71)	(2.28)	(2.78)
$D(\beta^{imc})_2 \times \tilde{R}^{imc}_{t-1}$		0.0414	0.0187	0.0419	0.0222	0.0220
		(2.04)	(0.88)	(2.50)	(1.50)	(1.32)
$D(\beta^{imc})_3 \times \tilde{R}^{imc}_{t-1}$		0.0843	0.0433	0.0391	0.0200	0.0146
		(2.63)	(1.96)	(1.15)	(0.83)	(0.71)
$D(\beta^{imc})_4 \times \tilde{R}^{imc}_{t-1}$		0.1329	0.0731	0.0749	0.0451	0.0461
		(3.38)	(2.52)	(2.55)	(1.97)	(1.91)
$D(\beta^{imc})_5 \times \tilde{R}^{imc}_{t-1}$		0.2014	0.1346	0.1398	0.1074	0.1132
		(4.47)	(4.95)	(4.12)	(4.86)	(3.82)
Observations	13456	13456	13456	13456	13456	13456
R^2	0.013	0.039	0.333	0.241	0.411	0.537
Industry/Firm FE	N	N	N	I	I	F
Controls (i_{t-1})	N	N	Y	N	Y	N
Controls ($Q_{t-1}, CF_{t-1}, K_{t-1}, E_{t-1}/A_{t-1}$)	N	N	N	Y	Y	Y

Table IA.V
Comovement in Firm Investment, Adjusted for Book Leverage

The table shows estimates of equation (34) in the main text, adjusted using book leverage. The leverage adjusted β^{imc} is computed as $\beta^{imc} = \hat{\beta}^{imc} \times B_E/B_A$, where B_E refers to stockholder's equity (Compustat item seq) and B_A refers to assets (Compustat item at). See the main text and notes to Tables V and VI for more details.

	(1)	(2)	(3)	(4)	(5)	(6)
$\tilde{R}^{imc}_{t-1}$	0.0959	0.0571	0.0525	0.0659	0.0613	0.0559
	(4.90)	(5.60)	(5.11)	(4.21)	(4.01)	(4.20)
$D(\beta_{imc})_2 \times \tilde{R}^{imc}_{t-1}$		0.0061	0.0072	-0.0003	0.0010	0.0042
		(0.36)	(0.46)	(-0.03)	(0.08)	(0.38)
$D(\beta_{imc})_3 \times \tilde{R}^{imc}_{t-1}$		0.0261	0.0237	0.0105	0.0104	0.0184
		(1.01)	(1.00)	(0.64)	(0.69)	(1.30)
$D(\beta_{imc})_4 \times \tilde{R}^{imc}_{t-1}$		0.0655	0.0629	0.0462	0.0463	0.0479
		(2.65)	(2.69)	(2.67)	(2.75)	(2.70)
$D(\beta_{imc})_5 \times \tilde{R}^{imc}_{t-1}$		0.0966	0.0943	0.0728	0.0740	0.0797
		(3.54)	(4.07)	(3.76)	(4.54)	(5.74)
Observations	62495	62495	62495	62495	62495	62495
R^2	0.009	0.032	0.085	0.161	0.191	0.438
Industry/Firm FE	N	N	N	I	I	F
Controls (i_{t-1})	N	N	Y	N	Y	N
Controls ($Q_{t-1}, CF_{t-1}, K_{t-1}, E_{t-1}/A_{t-1}$)	N	N	N	Y	Y	Y

Table IA.VI
Comovement in Firm Investment, Adjusted for Market Leverage

The table shows estimates of equation (34) in the main text, adjusted using market leverage. The leverage adjusted β^{imc} is computed as $\beta^{imc} = \hat{\beta}^{imc} \times M_E/M_A$, where M_E refers to CRSP December market capitalization and M_A refers to the sum of CRSP December market capitalization, preferred stock (Compustat item pstkrv), and long term debt (Compustat item dltt). See the main text and notes to Tables V and VI for more details.

	(1)	(2)	(3)	(4)	(5)	(6)
$\tilde{R}^{imc}_{t-1}$	0.0959	0.0541	0.0502	0.0633	0.0592	0.0573
	(4.90)	(5.44)	(4.88)	(4.42)	(4.20)	(4.41)
$D(\beta_{imc})_2 \times \tilde{R}^{imc}_{t-1}$		0.0007	0.0009	-0.0030	-0.0022	0.0005
		(0.05)	(0.07)	(-0.25)	(-0.19)	(0.05)
$D(\beta_{imc})_3 \times \tilde{R}^{imc}_{t-1}$		0.0264	0.0252	0.0116	0.0123	0.0148
		(1.22)	(1.26)	(0.68)	(0.77)	(0.92)
$D(\beta_{imc})_4 \times \tilde{R}^{imc}_{t-1}$		0.0632	0.0594	0.0427	0.0420	0.0378
		(2.55)	(2.62)	(2.18)	(2.29)	(2.32)
$D(\beta_{imc})_5 \times \tilde{R}^{imc}_{t-1}$		0.1185	0.1137	0.0887	0.0882	0.0910
		(4.30)	(4.93)	(4.33)	(5.03)	(6.08)
Observations	62495	62495	62495	62495	62495	62495
R^2	0.009	0.026	0.080	0.163	0.192	0.438
Industry/Firm FE	N	N	N	I	I	F
Controls (i_{t-1})	N	N	Y	N	Y	N
Controls ($Q_{t-1}, CF_{t-1}, K_{t-1}, E_{t-1}/A_{t-1}$)	N	N	N	Y	Y	Y

Table IA.VII
Comovement in Firm Investment, Within and Between Industry

The table shows estimates of equation (34) in the main text, comparing within- and between industry sorts. We define industries according to Fama-French 30 industry classification. In Panel A we estimate a within specification by sorting firms into IMC beta quintiles within industry-year. Standard errors are clustered by year. The four proxies for the IST shock are normalized to unit standard deviation. In Panel B we estimate a between specification by collapsing the data at the industry-year level. In Panel C we estimate a between specification by sorting firms into quintiles based on the industry IMC beta.

	Panel A. Within industries		Panel B. Between industries		Panel C. Between industries	
			Industry-Level		Firm-Level	
$\tilde{R}^{imc}_{t-1}$	0.0038	0.0032	0.0075	0.0061	0.0068	0.0045
	(1.43)	(1.25)	(1.81)	(1.55)	(1.65)	(1.39)
$D(\beta_{imc})_3 \times \tilde{R}^{imc}_{t-1}$	0.0027	0.0013	-0.0009	-0.0001	0.0039	0.0027
	(1.76)	(1.09)	(-0.20)	(-0.02)	(1.12)	(1.15)
$D(\beta_{imc})_5 \times \tilde{R}^{imc}_{t-1}$	0.0099	0.0078	0.0077	0.0057	0.0139	0.0093
	(3.21)	(3.59)	(1.36)	(1.03)	(2.91)	(2.93)
Δz_{t-1}	-0.0005	0.0023	0.0019	0.0025	0.0010	0.0038
	(-0.17)	(0.69)	(0.38)	(0.55)	(0.26)	(0.83)
$D(\beta_{imc})_3 \times (\Delta z_{t-1})$	0.0034	0.0017	0.0022	0.0024	0.0048	0.0016
	(2.33)	(1.01)	(0.74)	(0.71)	(1.42)	(0.56)
$D(\beta_{imc})_5 \times (\Delta z_{t-1})$	0.0092	0.0047	0.0039	0.0020	0.0110	0.0047
	(4.49)	(2.93)	(0.92)	(0.42)	(2.16)	(1.70)
Δic_{t-1}	0.0056	0.0083	0.0056	0.0032	0.0084	0.0101
	(2.17)	(3.27)	(1.34)	(0.82)	(2.17)	(3.09)
$D(\beta_{imc})_3 \times (\Delta ic_{t-1})$	0.0040	0.0014	0.0044	0.0057	0.0053	0.0011
	(2.96)	(0.89)	(1.29)	(1.57)	(1.55)	(0.44)
$D(\beta_{imc})_5 \times (\Delta ic_{t-1})$	0.0113	0.0064	0.0105	0.0120	0.0109	0.0050
	(5.10)	(3.75)	(2.25)	(2.40)	(2.82)	(1.83)
$-\tilde{R}^{hml}_{t-1}$	-0.0011	0.0000	0.0041	0.0049	-0.0017	-0.0002
	(-0.39)	(0.02)	(0.96)	(1.28)	(-0.48)	(-0.07)
$D(\beta_{imc})_3 \times (-\tilde{R}^{hml}_{t-1})$	0.0025	0.0015	-0.0003	-0.0027	0.0145	0.0085
	(1.73)	(1.14)	(-0.08)	(-0.63)	(3.54)	(2.71)
$D(\beta_{imc})_5 \times (-\tilde{R}^{hml}_{t-1})$	0.0063	0.0038	-0.0018	-0.0023	0.0089	0.0048
	(2.19)	(1.87)	(-0.39)	(-0.55)	(1.80)	(1.50)
Observations	63368	63368	1234	1234	63368	63368
Controls	-	Y	-	Y	-	Y
Fixed Effects	-	Y	-	Y	-	Y

Table IA.VIII
Portfolios Sorted on IMC Beta (Between and Within Industry)

The table shows excess returns and CAPM alphas and betas for three sets of portfolios. Panel A reports results of sorting firms into portfolios based on IMC beta within industry, Panel B reports results of sorting industry portfolios into quintiles based on IMC beta, and Panel C reports results of sorting firms into portfolios based on the average IMC beta for the industry. We use monthly data and annualize alpha estimates by multiplying by 12.

Panel A. Within industries						
Firm IMC Beta (industry rank)	Lo	2	3	4	Hi	Hi - Lo
Excess Return (%)	6.62	5.45	5.50	4.75	3.79	-2.84
	(2.93)	(2.57)	(2.37)	(1.69)	(1.11)	(-1.14)
σ (%)	15.34	14.36	15.71	19.07	23.05	16.86
α(%)	2.53	1.29	0.93	-0.61	-2.53	-5.06
	(2.32)	(1.83)	(1.34)	(-0.58)	(-1.67)	(-2.24)
β_{MKT}	0.87	0.89	0.98	1.14	1.35	0.48
	(29.71)	(48.68)	(64.89)	(40.48)	(31.99)	(7.59)
R^2(%)	76.78	90.38	91.40	85.21	81.14	18.85
Panel B. Between industry: sort industries on $\bar{\beta}_{imc}$						
Industry IMC Beta	Lo	2	3	4	Hi	Hi - Lo
Excess Return (%)	7.19	6.78	5.80	5.80	7.28	0.09
	(2.82)	(2.52)	(2.00)	(1.79)	(2.07)	(0.03)
σ (%)	17.08	18.03	19.41	21.64	23.57	16.61
α(%)	3.32	2.56	1.27	0.73	1.77	-1.55
	(2.66)	(1.98)	(0.94)	(0.49)	(1.05)	(-0.69)
β_{MKT}	0.80	0.88	0.94	1.05	1.14	0.34
	(9.49)	(9.96)	(12.45)	(13.30)	(14.73)	(3.42)
R^2(%)	73.08	78.00	77.49	77.93	77.63	13.76
Panel C. Between industry: sort firms on $\bar{\beta}_{imc}$						
Industry IMC Beta	Lo	2	3	4	Hi	Hi - Lo
Excess Return (%)	8.52	4.93	4.12	4.07	4.87	-3.64
	(3.94)	(2.16)	(1.70)	(1.61)	(1.71)	(-1.77)
σ (%)	14.67	15.45	16.48	17.17	19.30	13.98
α(%)	4.67	0.72	-0.46	-0.55	-0.47	-5.13
	(4.12)	(0.67)	(-0.43)	(-0.48)	(-0.38)	(-2.61)
β_{MKT}	0.82	0.90	0.98	0.99	1.14	0.32
	(30.47)	(32.97)	(43.05)	(32.35)	(42.73)	(7.27)
R^2(%)	74.28	80.00	83.31	78.18	82.63	12.29

Table IA.IX
Double-Sorted Portfolios:
Between and Within-Industry IMC Beta

The table shows CAPM alphas and IMC betas of double sorted portfolios: first on the industry average IMC beta ($\bar{\beta}_{imc}$) and then on the deviation from the IMC beta from the industry average ($\beta_{imc} - \bar{\beta}_{imc}$). We use monthly data and annualize alpha estimates by multiplying by 12.

CAPM alpha	Between industries		Within industries $\beta_{imc} - \bar{\beta}_{imc}$					
			Lo	2	3	4	Hi	Hi-Lo
$\bar{\beta}_{imc}$	Lo	4.67	3.93	5.55	6.13	3.76	2.96	-0.97
		(4.12)	(2.07)	(3.82)	(4.42)	(2.80)	(1.81)	(-0.45)
	2	0.72	3.20	1.85	0.39	-0.23	-5.50	-8.70
		(0.67)	(2.03)	(1.30)	(0.25)	(-0.16)	(-2.88)	(-3.61)
	3	-0.46	1.03	0.94	0.33	-2.71	-5.24	-6.26
		(-0.43)	(0.60)	(0.69)	(0.24)	(-1.67)	(-2.52)	(-2.38)
	4	-0.55	1.71	0.90	-1.26	-0.36	-8.20	-9.90
		(-0.48)	(0.93)	(0.62)	(-0.76)	(-0.19)	(-3.39)	(-3.11)
	5	-0.47	3.91	0.44	0.08	-1.92	-1.97	-5.88
		(-0.38)	(2.05)	(0.27)	(0.05)	(-0.93)	(-0.72)	(-1.75)
	Hi–Lo	-5.13						
		(-2.61)						

IMC beta	Between industries		Within industries $\beta_{imc} - \bar{\beta}_{imc}$					
			Lo	2	3	4	Hi	Hi-Lo
$\bar{\beta}_{imc}$	Lo	0.17	0.12	0.14	0.19	0.39	0.53	0.41
		(2.75)	(1.68)	(2.17)	(2.83)	(5.75)	(6.42)	(8.04)
	2	0.33	0.18	0.27	0.32	0.55	0.83	0.65
		(5.16)	(2.47)	(3.84)	(4.22)	(6.97)	(8.70)	(8.85)
	3	0.42	0.20	0.30	0.45	0.61	0.96	0.76
		(6.44)	(2.72)	(5.17)	(6.17)	(6.91)	(9.00)	(10.13)
	4	0.52	0.24	0.39	0.60	0.89	1.27	1.03
		(6.43)	(2.93)	(5.04)	(6.05)	(8.02)	(12.57)	(11.83)
	Hi	0.76	0.35	0.55	0.79	1.24	1.62	1.26
		(10.81)	(3.55)	(6.51)	(10.52)	(16.11)	(13.79)	(15.20)
	Hi–Lo	0.59						
		(13.04)						

Table IA.X
Asset Pricing Test: IMC Beta Portfolios, Constrained Risk Premia

Panel A reports asset-pricing tests on 10 portfolios sorted on β^{imc}_{t-1}, where we constrain the factor risk premium to equal the in-sample average return of each portfolio. Standard errors are computed using Newey-West with one lag to adjust for autocorrelation in returns. t-statistics are reported in parentheses. Estimation is done using monthly data. We report annualized estimates of mean returns and alphas by multiplying the monthly estimates by 12. Panel A reports results using the market and IMC portfolios and Panel B reports results using the market and HML portflios.

β^{imc} decile	Lo	2	3	4	5	6	7	8	9	Hi	Hi - Lo
Panel A. Market and IMC											
β^{mkt}	0.86	0.86	0.88	0.92	0.99	1.04	1.06	1.14	1.27	1.39	0.53
	(21.17)	(34.96)	(42.91)	(54.68)	(56.58)	(58.23)	(56.46)	(62.21)	(44.73)	(36.52)	(8.28)
β^{imc}	-0.48	-0.39	-0.41	-0.33	-0.29	-0.08	-0.01	0.28	0.59	1.00	1.48
	(-9.71)	(-10.67)	(-14.66)	(-7.16)	(-11.05)	(-2.66)	(-0.17)	(4.42)	(10.86)	(10.99)	(17.40)
$\alpha(\%)$	0.88	0.92	1.63	1.97	0.45	0.31	0.02	0.16	-0.55	-2.11	-2.99
	(0.61)	(0.97)	(2.03)	(2.56)	(0.64)	(0.40)	(0.02)	(0.13)	(-0.45)	(-1.26)	(-1.25)
$R^2(\%)$	67.56	82.62	87.02	89.03	91.65	91.73	89.05	87.87	89.82	87.06	65.73
Panel B. Market and HML											
β^{mkt}	0.84	0.82	0.84	0.88	0.96	1.04	1.07	1.18	1.34	1.53	0.69
	(21.27)	(38.61)	(31.74)	(39.52)	(50.16)	(62.38)	(52.81)	(49.10)	(37.96)	(28.57)	(8.97)
β^{hml}	0.56	0.34	0.31	0.22	0.22	0.13	0.04	-0.15	-0.41	-0.55	-1.11
	(7.38)	(5.87)	(5.03)	(3.77)	(4.67)	(3.74)	(0.74)	(-3.28)	(-5.20)	(-6.03)	(-7.87)
$\alpha(\%)$	-0.05	0.64	1.53	2.01	0.38	0.02	-0.10	0.01	-0.50	-2.63	-2.58
	(-0.04)	(0.59)	(1.50)	(2.20)	(0.47)	(0.02)	(-0.12)	(0.01)	(-0.33)	(-1.25)	(-0.90)
$R^2(\%)$	66.91	78.30	81.03	85.03	89.19	91.92	89.08	86.22	85.33	76.80	42.80

Table IA.XI
Asset Pricing Test: BE/ME portfolios, Constrained Risk Premia

The table reports time-series asset pricing tests for the decile portfolios sorted on book-to-market, where we constrain the factor risk premium to equal the in-sample average return of each portfolio. Panel A reports results using the market portfolio and IMC. Panel B reports results using the market portfolio and HML. Panel C reports results using the market portfolio, IMC, and SMB. Panel D reports results using the market portfolio, SMB, and the 10-minus-1 IMC beta portfolio.

BE/ME	Lo	2	3	4	5	6	7	8	9	Hi	Hi - Lo
Panel A: MKT and IMC											
α	-1.40	0.84	-0.63	0.94	0.47	1.36	0.92	3.02	2.97	4.12	5.52
	(-1.21)	(0.87)	(-0.81)	(1.03)	(0.52)	(1.30)	(0.60)	(2.16)	(1.67)	(2.01)	(1.83)
β^{mkt}	1.03	0.96	1.00	0.89	0.98	0.99	1.02	1.05	1.13	1.11	0.07
	(14.44)	(23.79)	(21.89)	(13.99)	(18.31)	(11.22)	(9.99)	(12.73)	(13.64)	(10.82)	(0.50)
β^{imc}	-0.10	-0.23	-0.24	-0.19	-0.41	-0.41	-0.49	-0.55	-0.51	-0.37	-0.27
	(-1.53)	(-3.82)	(-2.94)	(-2.85)	(-7.28)	(-4.51)	(-5.43)	(-7.17)	(-4.46)	(-3.13)	(-2.28)
R^2	81.55	88.41	90.79	84.95	88.67	82.37	79.70	82.42	73.93	70.07	9.10
Panel B: MKT and HML											
β^{mkt}	0.95	0.96	0.99	0.91	0.94	0.92	0.97	1.03	1.07	1.18	0.23
	(46.09)	(47.59)	(52.01)	(36.98)	(38.18)	(36.72)	(45.86)	(46.07)	(40.79)	(32.56)	(5.30)
β^{chml}	-0.42	-0.10	0.17	0.27	0.38	0.50	0.66	0.74	0.76	0.82	1.24
	(-6.00)	(-2.33)	(2.87)	(5.24)	(6.64)	(11.24)	(15.61)	(19.63)	(17.64)	(9.52)	(8.73)
$\alpha(\%)$	0.54	1.63	-0.61	0.48	0.09	0.21	-1.21	0.81	0.48	1.44	0.90
	(0.55)	(1.99)	(-0.71)	(0.49)	(0.10)	(0.24)	(-1.45)	(0.86)	(0.47)	(1.10)	(0.51)
$R^2(\%)$	89.59	90.34	88.77	85.84	85.89	85.51	88.72	88.14	87.42	83.65	54.43
Panel C: MKT, IMC, and SMB											
α	-0.97	1.30	-0.51	0.89	0.28	1.45	0.66	2.48	1.98	3.15	4.12
	(-0.89)	(1.31)	(-0.67)	(0.98)	(0.33)	(1.41)	(0.46)	(1.87)	(1.30)	(1.55)	(1.43)
β^{mkt}	1.07	1.00	1.01	0.89	0.97	1.00	1.00	1.00	1.04	1.03	-0.04
	(16.42)	(23.47)	(25.97)	(13.85)	(17.34)	(11.95)	(9.44)	(12.32)	(12.11)	(10.62)	(-0.30)
β^{imc}	-0.10	-0.22	-0.24	-0.20	-0.41	-0.41	-0.49	-0.55	-0.52	-0.34	-0.25
	(-1.44)	(-4.02)	(-2.89)	(-2.83)	(-7.29)	(-4.43)	(-5.65)	(-7.90)	(-5.00)	(-3.72)	(-2.21)
β^{smb}	-0.16	-0.17	-0.04	0.02	0.07	-0.04	0.10	0.20	0.37	0.36	0.53
	(-1.59)	(-2.45)	(-0.57)	(0.22)	(1.40)	(-0.30)	(1.18)	(3.09)	(3.63)	(3.68)	(3.22)
R^2	82.80	90.20	90.91	84.98	88.98	82.44	80.18	84.47	79.28	75.05	16.66
Panel D: MKT, SMB, and high-minus-low IMC beta											
α	-0.38	1.59	-0.43	0.84	0.04	0.98	-0.00	1.88	1.22	2.40	2.78
	(-0.31)	(1.61)	(-0.52)	(0.88)	(0.05)	(1.03)	(-0.00)	(1.77)	(0.93)	(1.30)	(1.01)
β^{mkt}	1.02	0.97	1.00	0.89	0.98	1.03	1.05	1.04	1.10	1.08	0.07
	(18.82)	(19.64)	(25.85)	(14.18)	(18.91)	(15.62)	(13.34)	(18.92)	(17.01)	(15.20)	(0.65)
β^{10m1}	0.05	-0.04	-0.08	-0.08	-0.19	-0.22	-0.28	-0.29	-0.31	-0.24	-0.29
	(1.11)	(-1.06)	(-1.59)	(-2.08)	(-4.74)	(-5.00)	(-7.44)	(-8.77)	(-8.09)	(-6.31)	(-4.09)
β^{smb}	-0.19	-0.16	-0.02	0.05	0.14	0.05	0.20	0.31	0.49	0.46	0.65
	(-1.87)	(-2.26)	(-0.23)	(0.51)	(2.28)	(0.42)	(2.99)	(5.88)	(6.35)	(4.89)	(4.11)
R^2	83.01	88.25	89.64	84.68	89.46	86.01	86.44	89.68	85.45	80.11	32.01

Table IA.XII
Calibration Moments - With Fixed Operating Costs

The table compares sample moments to moments in simulated data in a version of the model with fixed costs (operating leverage). Relative to the baseline model, adding operating leverage reduces the level of Q and profitability, reduces the spread in Q, increases a little bit the skewness in the firm distribution, increases the IQR in relative firm size, and increases the correlation between Q and size.

Moment	Data	Model		
		Median	5%	95%
Firm investment rate, median	0.112	0.122	0.061	0.232
Firm investment rate, IQR	0.157	0.162	0.086	0.265
Cash flows-to-Capital, median	0.160	0.232	0.204	0.253
Cash flows-to-Capital, IQR	0.234	0.222	0.207	0.242
Tobin's Q, median	1.412	1.603	1.024	2.065
Tobin's Q, IQR	2.981	1.059	0.682	1.865
IMC beta, median	0.683	0.710	0.400	1.062
IMC beta, IQR	0.990	0.552	0.428	0.676
Relative firm size, median	0.201	0.664	0.626	0.683
Relative firm size, IQR	0.830	1.278	1.236	1.331
Correlation between Tobin's Q and relative firm size	0.162	0.242	0.127	0.399