Appendix D from Liu et al., "Investment-Based Expected Stock Returns"

(JPE, vol. 117, no. 6, p. 1105)

A. Unabridged Tables

Tables D1–D4 in this appendix report the unabridged versions of tables 1, 3, 4, and 5 in the paper.

B. Robustness

This section reports detailed results from a long list of robustness tests that are described only briefly in the paper.

1. Second-Stage GMM

The estimation and test results reported in the paper are based on one-stage GMM. Table D5 reports that the parameter estimates from the second-stage GMM are similar to the first-stage estimates. Table D6 and figures D1 and D2 show that the inferences about the expected return errors and variance errors from the second-stage GMM are largely similar to those from the one-stage GMM.

2. The Market Value of Debt

The estimation and test results reported in the paper are based on the book value of debt as the proxy for the market value of debt, B_{it}, in the model. In this appendix we use the Bernanke and Campbell (1988) algorithm to convert the book value of debt into the market value of debt. The detailed algorithm is described in Whited (1992, 1457–58).

The imputed market values of debt are highly correlated with the book values of debt, and their use makes little difference for the Euler equation estimation results. Table D7 reports that the parameter estimates with the market value of debt are similar to the benchmark estimates. Table D8 and figures D3 and D4 show that the inferences about the expected return errors and variance errors with the market value of debt are largely similar to those with the book value of debt.

3. Value-Weighted Returns

The benchmark estimation results reported in the paper are based on equal-weighted portfolio returns. Table D9 shows that the estimates of the adjustment cost parameter, a, are somewhat smaller than those in the benchmark estimation when we use the q-theory model to match expected returns only. The estimates of a are similar to those in the benchmark estimation when the model is used to match both expected returns and variances.

Table D10 shows that the q-theory model performs reasonably well in accounting for the expected returns and variances of the testing portfolios. Although the model produces an expected return error of -2.23 percent per year ($t = -1.91$) for the high-minus-low SUE portfolio when matching expected returns alone, this error is only 1.74 percent per year ($t = 0.89$) when matching means and variances of returns of 10 SUE portfolios simultaneously. This error is smaller than the corresponding error of 12.37 percent per year ($t = 2.51$) in the benchmark estimation. The expected return error for the high-minus-low B/M portfolio is only -0.53 percent per year ($t = -0.18$) when matching both expected returns and stock return variances. In contrast, this error in the benchmark estimation with equal-weighted returns is much larger, 5.89 percent ($t = 1.08$). The other aspects of the estimation and tests are similar to the benchmark specification. More details are in the scatter plots of figures D5 and D6.

4. *Alternative Window Length in the Standard Bartlett Kernel*

We consider two alternative cases with window length in the standard Bartlett kernel different from five (the benchmark specification). The first case has the window length of one, and the second case has the window length of 10. Changing the window length in the Bartlett kernel does not affect the parameter estimates. Only their standard errors, χ^2, and p-values of various tests are affected. As such, the expected return errors and the variance errors are identical to those in the benchmark estimation, and the scatter plots also remain the same. Even with standard errors affected, tables D11–D14 show that the basic inferences are largely similar to those in the benchmark estimation and tests.

5. *Alternative Measures of Capital and Investment*

Our basic results are robust to an alternative measure of the capital stock as the net property, plant, and equipment (Compustat annual item 8) and to an alternative definition of investment as capital expenditures (item 128). Tables D15–D18 report the parameter estimates and Euler equation errors and figures D7–D10 report the related scatter plots.

6. *Time-Invariant Tax Rates*

The benchmark specification uses time-varying tax rates. Using time-invariant tax rates measured at the sample mean of 42.3 percent from 1963 to 2005 yields largely similar results. See table D19 for the parameter estimates and tests of overidentification, table D20 for Euler equation errors, and figures D11 and D12 for the scatter plots in the alternative specification with time-invariant tax rates.

7. *Portfolio-Specific Tax Rates*

The benchmark specification uses time-varying but portfolio-invariant tax rates. Using time-varying and portfolio-specific corporate tax rates yields largely similar results. To measure the portfolio-specific corporate tax rate, τ^i_{t+1}, we first construct firm-specific tax rates using the trichotomous variable approach of Graham (1996) and then take the value-weighted tax rates across all firms within a given portfolio i. In estimating the model with firm-specific tax rates, we assume that firms take these tax rates as exogenous. Table D21 reports the details for the parameter estimates and tests of overidentification, table D22 for Euler equation errors, and figures D13 and D14 for the scatter plots in the alternative specification with time-varying and portfolio-specific tax rates.

Table D1

Descriptive Statistics of Testing Portfolio Returns

	Low	2	3	4	5	6	7	8	9	High	H−L	m.a.e.	[p]
						A. 10 SUE Portfolios							
$\bar{r}_i^S$	10.89	12.04	14.95	15.43	18.95	19.39	20.34	20.43	22.53	23.39	12.50		
σ_i^S	22.35	20.50	22.01	21.42	22.51	23.50	22.59	21.87	23.09	21.13	8.46		
e_i	−1.69	−.18	2.59	3.28	6.56	6.43	7.61	7.72	9.78	10.86	12.55	5.67	[.00]
	[−.67]	[−.07]	[.98]	[1.08]	[2.17]	[2.43]	[3.09]	[3.46]	[3.37]	[4.96]	[12.69]		
e_i^{FF}	−4.59	−2.78	−.47	.56	1.96	3.05	4.26	6.07	6.83	9.47	14.06	4.01	[.00]
	[−2.24]	[−1.46]	[−.37]	[.24]	[1.02]	[1.86]	[3.76]	[4.99]	[3.52]	[6.73]	[8.15]		
e_i^C	−8.07	−4.56	−1.80	−2.42	−.04	−1.88	−1.58	4.13	6.39	5.31	13.38	3.62	[.00]
	[−1.34]	[−1.04]	[−.41]	[−.49]	[.01]	[.40]	[.38]	[1.10]	[1.63]	[1.37]	[.58]		
						B. 10 B/M Portfolios							
$\bar{r}_i^S$	8.65	14.14	15.68	15.54	17.93	18.47	19.50	19.94	22.81	25.78	17.13		
σ_i^S	27.93	26.44	24.94	23.64	24.92	23.12	23.69	22.49	22.93	26.97	20.54		
e_i	−4.91	.81	2.88	3.02	5.19	6.10	7.41	8.20	11.26	13.65	18.56	6.34	[.00]
	[−1.85]	[.34]	[1.20]	[1.26]	[2.29]	[2.69]	[2.54]	[3.06]	[4.06]	[3.77]	[6.00]		
e_i^{FF}	−.54	2.08	1.77	−1.06	1.80	2.42	2.26	3.58	5.63	6.76	7.30	2.79	[.00]
	[−.18]	[1.26]	[1.24]	[−1.02]	[1.81]	[2.40]	[1.98]	[4.05]	[5.81]	[2.57]	[2.55]		
e_i^C	−5.43	−1.86	−1.56	−1.60	.27	.56	.82	2.48	2.12	6.88	12.31	2.36	[.00]
	[−.72]	[−.27]	[−.26]	[−.32]	[.06]	[.13]	[.19]	[1.06]	[.65]	[2.40]	[.21]		

	C. 10 CI Portfolios												
$\bar{r}_i^S$	22.12	19.67	18.85	18.80	18.10	18.31	16.97	17.32	17.66	15.16	−6.96		
σ_i^S	32.42	26.17	23.73	23.31	22.26	22.25	21.91	21.44	25.32	26.73	11.37		
e_i	8.21	7.05	6.25	6.57	5.89	6.26	4.73	5.39	4.84	1.91	−6.30	5.71	[.01]
	[2.44]	[2.26]	[2.51]	[2.34]	[2.59]	[2.52]	[2.10]	[2.20]	[1.88]	[.67]	[−4.49]		
e_i^{FF}	6.45	3.01	2.85	2.58	1.54	1.41	1.22	1.91	1.29	.11	−6.34	2.24	[.01]
	[2.90]	[1.72]	[2.22]	[2.18]	[1.60]	[1.52]	[1.27]	[1.79]	[1.06]	[.06]	[−6.51]		
e_i^C	4.03	3.76	1.66	.12	.46	.04	−1.46	−.57	−1.09	−4.35	−8.38	1.75	[.00]
	[.75]	[.92]	[.42]	[.03]	[.12]	[.01]	[−.29]	[−.12]	[−.22]	[−.82]	[−.39]		

Note.—For each testing portfolio i, we report in annualized percent the average stock return, $\bar{r}_i^S$, the stock return volatility, σ_i^S, the intercept from the CAPM regression, e_i, the intercept from the Fama-French three-factor regression, e_i^{FF}, and the model error from the standard consumption-CAPM, e_i^C. The H−L portfolio is long in the high portfolio and short in the low portfolio. The heteroscedasticity- and autocorrelation-consistent t-statistics for the model errors are reported in brackets beneath the corresponding errors. m.a.e. is the mean absolute error in annual percent for a given set of 10 testing portfolios. For the CAPM and the Fama-French model, the p-values in brackets in the last column are for the Gibbons, Ross, and Shanken (1989) tests of the null hypothesis that the intercepts for a given set of portfolios are jointly zero. For the standard consumption-CAPM the p-values are for the χ^2 test from one-stage GMM that the moment restrictions are jointly zero. In panel A for the standard consumption-CAPM the estimate of the time preference coefficient is $\beta = 2.76$ (standard error 0.93) and the estimate of risk aversion is $\gamma = 127.59$ (54.86). In panel B $\beta = 3.31$ (1.23) and $\gamma = 142.08$ (58.51). In panel C $\beta = 3.30$ (1.23) and $\gamma = 143.28$ (57.59).

Table D2
Euler Equation Errors

	Low	2	3	4	5	6	7	8	9	High	H−L
	A. Euler Equation Errors from Matching Expected Returns										
	10 SUE Portfolios										
e_i^q	.26	−1.72	−.05	.72	1.66	.51	.61	−1.25	−.50	−.15	−.40
	[.61]	[−1.75]	[−.07]	[.98]	[1.70]	[.69]	[1.07]	[−1.12]	[−.59]	[−.14]	[−.41]
	10 B/M Portfolios										
e_i^q	−3.94	−3.20	−1.02	2.74	2.35	3.07	2.51	1.62	.05	−2.73	1.21
	[−1.76]	[−1.38]	[−.66]	[1.39]	[1.37]	[1.11]	[1.31]	[.59]	[.03]	[−1.37]	[.79]
	10 CI Portfolios										
e_i^q	−.97	−2.71	−.50	.93	2.72	3.37	.94	.46	−1.02	−1.45	−.49
	[−.51]	[−1.95]	[−.61]	[.96]	[1.74]	[2.19]	[.75]	[.78]	[−.94]	[−1.24]	[−.41]
	B. Euler Equation Errors from Matching Expected Returns and Variances										
	10 SUE Portfolios										
$e_i^{q^2}$	−.04	−.04	.01	−.01	.02	.03	.04	.01	.02	.03	.08
	[−1.93]	[−1.85]	[.76]	[−.40]	[.95]	[1.57]	[1.66]	[.92]	[.80]	[1.47]	[1.83]
e_i^q	−6.99	−6.50	−2.12	−1.62	2.60	1.79	2.27	1.48	3.75	5.38	12.37
	[−2.24]	[−2.27]	[−1.49]	[−1.06]	[1.91]	[1.32]	[1.82]	[.83]	[1.74]	[2.01]	[2.51]
	10 B/M Portfolios										
$e_i^{q^2}$	.10	.07	.06	.01	.01	.02	.01	−.01	−.02	−.10	−.20
	[2.35]	[2.19]	[2.07]	[.60]	[.50]	[.85]	[.28]	[−.31]	[−1.19]	[−1.99]	[−2.39]
e_i^q	−6.46	−3.83	−2.11	−.04	1.71	2.60	3.54	3.11	1.85	−.58	5.89
	[−1.89]	[−1.73]	[−1.02]	[−.02]	[.94]	[1.21]	[1.78]	[1.47]	[1.14]	[−.15]	[1.08]
	10 CI Portfolios										
$e_i^{q^2}$	.01	−.00	.02	.01	.03	.02	.02	.02	−.02	−.06	−.07
	[.34]	[−.17]	[1.13]	[.55]	[1.33]	[1.06]	[.75]	[1.05]	[−1.13]	[−1.77]	[−1.36]
e_i^q	1.29	−2.51	−.11	1.86	3.47	3.48	1.12	.28	−2.82	−5.32	−6.60
	[.49]	[−1.56]	[−.09]	[1.15]	[1.97]	[1.80]	[.88]	[.21]	[−1.53]	[−1.97]	[−2.04]

Note.—Euler equation errors and *t*-statistics are from one-stage GMM estimation with an identity weighting matrix. In panel A the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$. The expected return errors are defined as $e^q_i \equiv E_T[r^S_{it+1} - r^{Iw}_{it+1}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets. In panel B the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$ and $E[(r^S_{it+1} - E[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E[r^{Iw}_{it+1}])^2] = 0$. The variance errors are defined as $e^{\sigma^2}_i \equiv E_T[(r^S_{it+1} - E_T[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E_T[r^{Iw}_{it+1}])^2]$. The expected return errors are defined as in panel A. In the last column we report the difference in the expected return errors and the difference in the variance errors between the high and low portfolios, as well as their *t*-statistics (in brackets). Expected return errors are in annual percent, and variance errors are in annual decimals.

Table D3

Expected Returns Accounting

	Low	2	3	4	5	6	7	8	9	High	H−L	[$t_{\text{H−L}}$]
A. Characteristics in Levered Investment Returns												
10 SUE Portfolios												
I_{it+1}/K_{it+1}	.12	.12	.11	.11	.11	.11	.11	.11	.11	.12	.00	[.70]
$(I_{it+1}/K_{it+1})/(I_{it}/K_{it})$	.89	.93	.96	.96	1.00	1.01	1.02	1.05	1.07	1.06	.17	[4.06]
Y_{it+1}/K_{it+1}	1.52	1.52	1.48	1.47	1.50	1.58	1.61	1.62	1.65	1.83	.31	[5.16]
δ_{it+1}	.08	.07	.08	.07	.08	.08	.08	.08	.08	.08	.00	[.63]
w_{it}	.30	.29	.32	.28	.28	.26	.27	.27	.27	.21	−.10	[−5.83]
r^B_{it+1}	9.44	9.48	9.61	9.81	9.76	9.53	9.69	9.45	9.50	9.38	−.06	[−.27]
10 B/M Portfolios												
I_{it}/K_{it}	.18	.14	.13	.13	.11	.11	.10	.10	.09	.08	−.10	[−7.95]
$(I_{it+1}/K_{it+1})/(I_{it}/K_{it})$	.98	1.00	.99	.98	1.00	1.01	1.01	1.01	1.03	1.02	.04	[.68]
Y_{it+1}/K_{it+1}	1.95	1.88	1.70	1.58	1.45	1.37	1.30	1.32	1.39	1.38	−.57	[−6.77]
δ_{it+1}	.10	.08	.08	.08	.07	.07	.07	.07	.07	.07	−.03	[−5.01]
w_{it}	.08	.17	.25	.24	.27	.31	.34	.42	.45	.53	.44	[12.44]
r^B_{it+1}	8.17	8.01	8.04	8.12	8.09	8.24	8.32	8.29	8.33	8.52	.35	[1.05]
10 CI Portfolios												
I_{it}/K_{it}	.09	.09	.10	.10	.11	.12	.12	.13	.14	.16	.07	[11.06]
$(I_{it+1}/K_{it+1})/(I_{it}/K_{it})$	1.25	1.20	1.10	1.08	1.04	1.01	.99	.93	.91	.81	−.44	[−7.23]
Y_{it+1}/K_{it+1}	1.84	1.94	1.85	1.75	1.58	1.58	1.72	1.81	1.91	1.89	.05	[.38]
δ_{it+1}	.08	.07	.07	.07	.07	.07	.08	.07	.07	.08	.00	[−.46]
w_{it}	.35	.27	.24	.23	.25	.24	.23	.23	.26	.28	−.07	[−2.59]
r^B_{it+1}	8.47	8.50	8.33	8.27	8.27	8.23	8.14	8.13	8.27	8.44	−.03	[−.15]
B. Expected Return Errors from Comparative Static Experiments												
	Low	2	3	4	5	6	7	8	9	High	H−L	m.a.e.
10 SUE Portfolios												
$\overline{I_{it}/K_{it}}$	−2.48	−4.45	.17	1.99	4.45	1.80	1.80	1.01	1.13	−4.26	−1.78	2.35
$\overline{q_{it+1}/q_{it}}$	−5.23	−5.09	−1.83	−1.10	1.76	1.18	1.80	1.33	3.36	3.62	8.85	2.62
$\overline{Y_{it+1}/K_{it+1}}$	−.78	−2.60	−1.90	−1.10	.39	.70	1.21	−.52	.62	3.53	4.31	1.34
$\overline{w}_{it}$	.13	−1.35	.41	.83	1.89	.41	.44	−1.23	−.65	−1.46	−1.58	.88
10 B/M Portfolios												
$\overline{I_{it}/K_{it}}$	−42.06	−21.23	−12.22	−4.31	4.69	10.98	17.07	21.19	30.53	48.17	90.23	21.25
$\overline{q_{it+1}/q_{it}}$	−1.92	−.88	−.26	1.56	2.11	2.77	2.91	1.34	−.96	−4.06	−2.14	1.87
$\overline{Y_{it+1}/K_{it+1}}$	.16	.76	1.26	2.93	.92	.14	−1.63	−2.63	−2.65	−6.33	−6.49	1.94
$\overline{w}_{it}$	−6.00	−5.20	−1.68	1.66	2.19	2.63	3.37	4.03	3.34	5.58	11.58	3.57
10 CI Portfolios												
$\overline{I_{it}/K_{it}}$	2.86	−.40	1.03	2.06	3.50	3.08	.07	−.89	−3.01	−5.67	−8.53	2.26
$\overline{q_{it+1}/q_{it}}$	.73	−1.50	.10	1.39	2.97	3.41	.82	−.29	−2.01	−3.87	−4.60	1.71
$\overline{Y_{it+1}/K_{it+1}}$	.57	−.25	.17	.54	−.44	.40	−.15	.67	.69	.09	−.48	.40
$\overline{w}_{it}$	1.80	−2.32	−.93	.36	2.61	3.26	.62	−.02	−.71	−.91	−2.71	1.35

Note.—Panel A reports the averages of investment-to-capital, I_{it}/K_{it}, future investment growth, $(I_{it+1}/K_{it+1})/(I_{it}/K_{it})$, sales-to-capital, Y_{it+1}/K_{it+1}, the depreciation rate, δ_{it+1}, market leverage, w_{it}, and corporate bond returns in annual percent, r^{B}_{it+1}, for all the testing portfolios. The column H−L reports the average differences between high and low portfolios and the column $[t_{\text{H-L}}]$ reports the heteroscedasticity- and autocorrelation-consistent t-statistics for the test that the differences equal zero. Panel B performs four comparative static experiments denoted $\overline{I_{it}/K_{it}}$, $\overline{q_{it+1}/q_{it}}$, $\overline{Y_{it+1}/K_{it+1}}$, and $\overline{w_{it}}$, in which $q_{it+1}/q_{it} = [1 + (1-\tau_{t+1})a(I_{it+1}/K_{it+1})]/[1+(1-\tau_t)a(I_{it}/K_{it})]$. In the experiment denoted $\overline{Y_{it+1}/K_{it+1}}$, we set Y_{it+1}/K_{it+1} for a given set of 10 portfolios, indexed by i, to be its cross-sectional average in $t+1$. We then use the parameters reported in panel A of table 2 in the paper to reconstruct the levered investment returns, while keeping all the other characteristics unchanged. The other three experiments are designed analogously. We report the expected return errors defined as $e^q_i \equiv E_T[r^S_{it+1} - r^{Iw}_{it+1}]$ for the testing portfolios, the high-minus-low portfolios and the mean absolute value of e^q_i (m.a.e.).

Table D4
Correlations

	Low	2	3	4	5	6	7	8	9	High	All
					A. 10 SUE Portfolios						
$\rho(r^S_{it+1}, r^{Iw}_{it+1})$	−.28	−.19	−.19	−.15	−.21	−.26	−.23	−.22	−.18	−.26	−.11**
$\rho(r^S_{it}, r^{Iw}_{it+1})$	.22	.15	.11	.12	.01	.13	.21	.11	.03	.14	.19***
$\rho(r^S_{it+1}, I_{it+1}/I_{it})$	−.29	−.13	−.14	−.14	−.24	−.16	−.14	−.19	−.15	−.23	−.08
$\rho(r^S_{it}, I_{it+1}/I_{it})$	.18	.11	.07	.04	.01	.06	.13	.08	−.03	−.00	.14**
					B. 10 B/M Portfolios						
$\rho(r^S_{it+1}, r^{Iw}_{it+1})$	−.23	−.17	−.35***	−.23	−.17	−.12	−.24	−.12	−.13	−.05	−.12**
$\rho(r^S_{it}, r^{Iw}_{it+1})$	.06	.04	.35***	.25	.23	.20	.24	.08	.23	.33***	.22***
$\rho(r^S_{it+1}, I_{it+1}/I_{it})$	−.14	−.19	−.26*	−.14	−.06	−.07	−.28*	.00	−.16	−.13	−.15***
$\rho(r^S_{it}, I_{it+1}/I_{it})$	.12	.12	.31*	.20	.17	.04	.12	−.04	.26	.29*	.14***
					C. 10 CI Portfolios						
$\rho(r^S_{it+1}, r^{Iw}_{it+1})$	.22	.00	−.30*	.07	−.34**	−.37**	−.31*	−.30*	−.31*	−.30*	−.06
$\rho(r^S_{it}, r^{Iw}_{it+1})$	.44***	.13	.19	−.19	.16	.26	.27*	.26	.04	.30*	.21***
$\rho(r^S_{it+1}, I_{it+1}/I_{it})$	.28*	−.07	−.26	.05	.33**	.34**	.30*	.30*	−.25	−.12	−.04
$\rho(r^S_{it}, I_{it+1}/I_{it})$	.20	.23	.10	−.11	.10	.21	.14	.25	.03	.26	.16***

Note.—For each testing portfolio we report time-series correlations of stock returns (contemporaneous, r^S_{it+1}, and one-period-lagged, r^S_{it}) with levered investment returns, r^{Iw}_{it+1}, and with investment growth, I_{it+1}/I_{it}. $\rho(\cdot,\cdot)$ denotes the correlation between the two series in the parentheses. In the last column, denoted all, we report the correlations and their significance by pooling all the observations for a given set of 10 testing portfolios (SUE, B/M, or CI). The levered investment returns are constructed using the parameters in panel A of table 2 in the paper.

* Significant at the 10 percent level.

** Significant at the 5 percent level.

*** Significant at the 1 percent level.

Table D5
Parameter Estimates and Tests of Overidentification from the Second-Stage GMM

	SUE	B/M	CI
	A. Matching Expected Returns		
a	8.66	23.17	1.12
	[1.20]	[16.49]	[.31]
α	.30	.54	.20
	[.03]	[.20]	[.01]
χ^2	4.45	293.31	7.39
d.f.	8	8	8
p	.82	.00	.50
m.a.e.	2.87	2.42	1.47
	B. Matching Expected Returns and Variances		
a	29.37	11.20	16.13
	[4.17]	[1.10]	[2.06]
α	.61	.34	.36
	[.06]	[.01]	[.03]

$\chi^2_{(2)}$	6.85	7.53	7.46
d.f.(2)	8	8	8
p(2)	.55	.48	.49
m.a.e.(2)	.02	.04	.02
$\chi^2_{(1)}$	6.98	6.60	7.19
d.f.(1)	8	8	8
p(1)	.54	.58	.52
m.a.e.(1)	3.46	2.59	2.21
χ^2	7.27	8.25	8.50
d.f.	18	18	18
p	.99	.98	.97

Note.—Estimates and tests are from the second-stage GMM estimation with the two-step weighting matrix. In panel A the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$. a is the adjustment cost parameter and α is capital's share. Their standard errors are reported in brackets beneath the estimates. χ^2 is the statistic from the second-stage GMM that the moment conditions are jointly zero. d.f. is the degrees of freedom, and p is the p-value associated with the test. m.a.e. is the mean absolute error, $E_T[r^S_{it+1} - r^{Iw}_{it+1}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets, in annual percent across a given set of testing portfolios. In panel B the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$ and $E[(r^S_{it+1} - E[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E[r^{Iw}_{it+1}])^2] = 0$. $\chi^2_{(2)}$, d.f.(2), and p(2) are the statistic, degrees of freedom, and p-value for the χ^2 test that the variance errors, defined as $E_T[(r^S_{it+1} - E_T[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E_T[r^{Iw}_{it+1}])^2]$, are jointly zero. m.a.e.(2) is the mean absolute error in annual decimals. $\chi^2_{(1)}$, d.f.(1), and p(1) are the statistic, degrees of freedom, and p-value for the χ^2 test that the expected return errors, defined in the same way as in panel A, are jointly zero. m.a.e.(1) is the mean absolute expected return error in annual percent. χ^2, d.f., and p are the statistic, degrees of freedom, and p-value of the test that both the expected return errors and the variance errors are jointly zero.

Table D6
Euler Equation Errors from the Second-Stage GMM

	Low	2	3	4	5	6	7	8	9	High	H−L
	A. Euler Equation Errors from Matching Expected Returns										
	10 SUE Portfolios										
e^q_i	3.57	1.33	2.92	3.55	4.40	3.28	3.39	1.45	2.18	2.59	−.98
	[1.35]	[.70]	[1.21]	[1.46]	[1.66]	[1.31]	[1.55]	[.68]	[1.34]	[1.71]	[−.51]
	10 B/M Portfolios										
e^q_i	−4.64	−4.09	−1.96	1.90	1.44	2.11	1.48	.36	−1.48	−4.75	−.12
	[−1.38]	[−.98]	[−.92]	[.70]	[.61]	[.99]	[.65]	[.07]	[−.48]	[−.75]	[−.02]
	10 CI Portfolios										
e^q_i	−.33	−2.09	.15	1.56	3.33	4.03	1.68	1.33	−.02	−.15	.17
	[−.14]	[−.76]	[.06]	[.67]	[1.21]	[1.60]	[1.06]	[.85]	[−.01]	[−.07]	[.12]
	B. Euler Equation Errors from Matching Expected Returns and Variances										
	10 SUE Portfolios										
$e^{\sigma^2}_i$	−.05	−.04	.01	−.01	.02	.03	.04	.01	.02	.03	.08
	[−1.33]	[−1.34]	[.25]	[−.28]	[.92]	[1.13]	[1.11]	[.37]	[.42]	[.84]	[2.18]
e^q_i	−6.98	−6.49	−2.10	−1.61	2.61	1.81	2.28	1.50	3.77	5.41	12.39
	[−1.47]	[−1.74]	[−.62]	[−.45]	[.72]	[.47]	[.71]	[.51]	[.99]	[1.41]	[2.45]
	10 B/M Portfolios										
$e^{\sigma^2}_i$	.10	.08	.06	.02	.02	.02	.01	−.01	−.02	−.10	−.20
	[2.24]	[1.70]	[1.58]	[.41]	[.35]	[.52]	[.22]	[−.20]	[−.57]	[−1.43]	[−2.35]
e^q_i	−6.49	−3.84	−2.11	−.02	1.73	2.63	3.58	3.15	1.92	−.44	6.04

	[−1.77]	[−1.19]	[−.71]	[−.01]	[.54]	[.90]	[1.40]	[.83]	[.62]	[−.07]	[1.03]
	10 CI Portfolios										
$e_i^{\sigma^2}$	.01	.00	.02	.01	.03	.02	.02	.02	−.02	−.06	−.07
	[.57]	[−.13]	[.76]	[.37]	[.99]	[.59]	[.50]	[.77]	[−.64]	[−1.17]	[−1.45]
e_i^q	1.14	−2.63	−.22	1.76	3.37	3.39	1.02	.18	−2.92	−5.42	−6.56
	[.22]	[−.76]	[−.06]	[.45]	[.95]	[1.10]	[.46]	[.09]	[−.81]	[−1.34]	[−1.56]

Note.—Euler equation errors and t-statistics (in brackets) are from the second-stage GMM estimation with the two-step weighting matrix. In panel A the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$. The expected return errors are defined as $e_i^q \equiv E_T[r^S_{it+1} - r^{Iw}_{it+1}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets. In panel B the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$ and $E[(r^S_{it+1} - E[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E[r^{Iw}_{it+1}])^2] = 0$. The variance errors are defined as $e_i^{\sigma^2} \equiv E_T[(r^S_{it+1} - E_T[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E_T[r^{Iw}_{it+1}])^2]$. The expected return errors are defined as in panel A. In the last column we report the difference in the expected return errors and the difference in the variance errors between the high and low portfolios, as well as their t-statistics. Expected return errors are in annual percent, and variance errors are in annual decimals.

Table D7

Parameter Estimates and Tests of Overidentification, the Market Value of Debt per the Bernanke and Campbell (1988) Algorithm

	SUE	B/M	CI
	A. Matching Expected Returns		
a	7.91	23.31	1.03
	[1.85]	[30.52]	[.30]
α	.33	.51	.21
	[.03]	[.37]	[.02]
χ^2	4.85	5.66	6.81
d.f.	8	8	8
p	.77	.69	.56
m.a.e.	.74	2.49	1.42
	B. Matching Expected Returns and Variances		
a	30.99	10.27	17.93
	[18.48]	[4.13]	[6.90]
α	.64	.32	.38
	[.30]	[.06]	[.09]
$\chi^2_{(2)}$	5.58	6.50	6.38
d.f.(2)	8	8	8
p(2)	.70	.59	.60
m.a.e.(2)	.02	.05	.02
$\chi^2_{(1)}$	5.68	5.85	6.32
d.f.(1)	8	8	8
p(1)	.68	.66	.61
m.a.e.(1)	3.50	3.30	2.03
χ^2	5.77	7.07	6.91
d.f.	18	18	18
p	1.00	.99	.99

Note.—We measure the market value of debt, B_{it}, per the Bernanke and Campbell (1988) algorithm. Estimates and tests are from the first-stage GMM estimation with an identity weighting matrix. In panel A the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$. a is the adjustment cost parameter and α is capital's share. Their standard errors are reported in brackets beneath the estimates. χ^2 is the statistic from the first-stage GMM that the moment conditions are jointly zero. d.f. is the degrees of freedom, and p is the p-value associated with the test. m.a.e. is the mean absolute error, $E_T[r^S_{it+1} - r^{Iw}_{it+1}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets, in annual percent across a given set of testing portfolios. In panel B the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$ and $E[(r^S_{it+1} - E[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E[r^{Iw}_{it+1}])^2] = 0$. $\chi^2_{(2)}$, d.f.(2), and $p(2)$ are the statistic, degrees of freedom, and p-value for the χ^2 test that the variance errors, defined as $E_T[(r^S_{it+1} - E_T[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E_T[r^{Iw}_{it+1}])^2]$, are jointly zero. m.a.e.(2) is the mean absolute variance error in annual decimals. $\chi^2_{(1)}$, d.f.(1), and $p(1)$ are the statistic, degrees of freedom, and p-value for the χ^2 test that the expected return errors, defined in the same way as in panel A, are jointly zero. m.a.e.(1) is the mean absolute expected return error in annual percent. χ^2, d.f., and p are the statistic, degrees of freedom, and p-value of the test that both the expected return errors and the variance errors are jointly zero.

Table D8

Euler Equation Errors, the Market Value of Debt per the Bernanke and Campbell (1988) Algorithm

	Low	2	3	4	5	6	7	8	9	High	H−L
	A. Euler Equation Errors from Matching Expected Returns										
	10 SUE Portfolios										
e^q_i	.30	−1.81	−.06	.80	1.70	.43	.52	−1.24	−.51	−.08	−.38
	[.78]	[−1.85]	[−.10]	[1.12]	[1.68]	[.61]	[1.19]	[−1.21]	[−.74]	[−.08]	[−.46]
	10 B/M Portfolios										
e^q_i	−4.13	−3.00	−.59	2.54	2.50	3.47	1.88	2.32	1.00	−3.47	.67
	[−1.81]	[−1.35]	[−.44]	[1.25]	[1.52]	[1.24]	[1.10]	[.83]	[.50]	[−1.43]	[.37]
	10 CI Portfolios										
e^q_i	−.57	−2.88	−.57	.74	2.71	3.22	1.12	.14	−.72	−1.55	−.99
	[−.39]	[−2.11]	[−.83]	[.83]	[1.98]	[2.21]	[.86]	[.21]	[−.75]	[−1.63]	[−.92]
	B. Euler Equation Errors from Matching Expected Returns and Variances										
	10 SUE Portfolios										
$e^{\sigma^2}_i$	−.04	−.03	.01	−.01	.01	.03	.04	.01	.02	.03	.06
	[−1.84]	[−1.79]	[.84]	[−.57]	[.53]	[1.54]	[1.71]	[.63]	[.92]	[1.34]	[1.75]
e^q_i	−6.67	−6.76	−2.46	−1.63	2.60	1.74	2.27	1.56	3.71	5.56	12.23
	[−2.24]	[−2.30]	[−1.67]	[−1.10]	[1.99]	[1.37]	[1.83]	[.84]	[1.77]	[2.05]	[2.29]
	10 B/M Portfolios										
$e^{\sigma^2}_i$	.10	.07	.07	.04	.03	.02	.05	.02	.00	−.13	−.23
	[2.36]	[2.00]	[1.96]	[1.24]	[.83]	[.99]	[1.41]	[.64]	[−.03]	[−1.87]	[−2.18]
e^q_i	−6.18	−3.14	−1.48	.95	2.06	3.62	4.09	4.32	4.11	−3.02	3.16
	[−1.69]	[−1.31]	[−.74]	[.47]	[1.20]	[1.72]	[1.73]	[1.69]	[1.70]	[−.52]	[.40]
	10 CI Portfolios										
$e^{\sigma^2}_i$	.02	−.01	.02	.01	.03	.01	.02	.01	−.02	−.05	−.07
	[.81]	[−.62]	[1.07]	[.42]	[1.25]	[.62]	[.84]	[.58]	[−1.13]	[−1.75]	[−1.45]
e^q_i	−.02	−2.50	.05	1.93	3.46	3.69	1.51	.05	−2.49	−4.63	−4.60
	[−.01]	[−1.53]	[.04]	[1.09]	[2.10]	[1.81]	[1.12]	[.04]	[−1.46]	[−1.95]	[−1.28]

Note.—We measure the market value of debt, B_{it}, per the Bernanke and Campbell (1988) algorithm. Euler equation errors and t-statistics (in brackets) are from the first-stage GMM estimation with an identity weighting matrix. In panel A the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$. The expected return errors are defined as $e^q_i \equiv E_T[r^S_{it+1} - r^{Iw}_{it+1}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets. In panel B the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$ and $E[(r^S_{it+1} - E[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E[r^{Iw}_{it+1}])^2] = 0$. The variance errors are defined as $e^{\sigma^2}_i \equiv E_T[(r^S_{it+1} - E_T[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E_T[r^{Iw}_{it+1}])^2]$. The expected return errors are defined as in panel A. In the last column we report the difference in the expected return errors and the difference in the variance errors between the high and low portfolios, as well as their t-statistics. Expected return errors are in annual percent, and variance errors are in annual decimals.

Table D9

Parameter Estimates and Tests of Overidentification, Value-Weighted Returns

	SUE	B/M	CI
	A. Matching Expected Returns		
a	.50	8.11	1.18
	[.41]	[5.44]	[.40]
α	.18	.27	.16
	[.03]	[.06]	[.02]
χ^2	5.36	6.16	5.85
d.f.	8	8	8
p	.72	.63	.66
m.a.e.	1.03	1.37	1.11
	B. Matching Expected Returns and Variances		
a	28.42	8.33	13.05
	[10.88]	[2.06]	[3.41]
α	.44	.25	.25
	[.16]	[.04]	[.05]
$\chi^2_{(2)}$	3.59	4.69	6.49
d.f.(2)	8	8	8
$p(2)$	.89	.79	.59
m.a.e.(2)	.02	.03	.03
$\chi^2_{(1)}$	3.30	3.11	3.44
d.f.(1)	8	8	8
$p(1)$	.91	.93	.90
m.a.e.(1)	1.30	1.69	2.23
χ^2	3.88	6.39	6.01
d.f.	18	18	18
p	1.00	.99	1.00

Note.—We value-weight all portfolio stock returns, r^S_{it}, and corporate bond returns, r^B_{it}. Estimates and tests are from the one-stage GMM estimation with an identity weighting matrix. In panel A the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$. a is the adjustment cost parameter and α is capital's share. Their standard errors are reported in brackets beneath the estimates. χ^2 is the statistic from the second-stage GMM that the moment conditions are jointly zero. d.f. is the degrees of freedom, and p is the p-value associated with the test. m.a.e. is the mean absolute error, $E_T[r^S_{it+1} - r^{Iw}_{it+1}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets, in annual percent across a given set of testing portfolios. In panel B the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$ and $E[(r^S_{it+1} - E[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E[r^{Iw}_{it+1}])^2] = 0$. $\chi^2_{(2)}$, d.f.(2), and $p(2)$ are the statistic, degrees of freedom, and p-value for the χ^2 test that the variance errors, defined as $E_T[(r^S_{it+1} - E_T[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E_T[r^{Iw}_{it+1}])^2]$, are jointly zero. m.a.e.(2) is the mean absolute variance error in annual decimals. $\chi^2_{(1)}$, d.f.(1), and $p(1)$ are the statistic, degrees of freedom, and p-value for the χ^2 test that the expected return errors, defined in the same way as in Panel A, are jointly zero. m.a.e.(1) is the mean absolute expected return error in annual percent. χ^2, d.f., and p are the statistic, degrees of freedom, and p-value of the test that both the expected return errors and the variance errors are jointly zero.

Table D10
Euler Equation Errors, Value-Weighted Returns

	Low	2	3	4	5	6	7	8	9	High	H−L
	A. Euler Equation Errors from Matching Expected Returns										
	10 SUE Portfolios										
e_i^q	.88	−1.29	.38	−.34	.32	−.64	1.67	−1.52	1.87	−1.35	−2.23
	[1.66]	[−1.38]	[.57]	[−.38]	[.35]	[−.60]	[1.84]	[−1.75]	[1.97]	[−1.27]	[−1.91]
	10 B/M Portfolios										
e_i^q	−.77	−1.41	−.96	.39	.09	1.88	3.21	1.39	.71	−2.86	−2.09
	[−.42]	[−.94]	[−.97]	[.31]	[.07]	[.90]	[2.01]	[.63]	[.38]	[−1.65]	[−1.27]
	10 CI Portfolios										
e_i^q	−1.45	−2.00	1.43	1.50	1.23	2.01	.02	.01	−.41	−1.07	.38
	[−.70]	[−1.64]	[1.01]	[1.04]	[1.04]	[1.04]	[.02]	[.01]	[−.32]	[−.80]	[.27]
	B. Euler Equation Errors from Matching Expected Returns and Variances										
	10 SUE Portfolios										
$e_i^{\sigma^2}$	−.03	−.02	.01	−.01	.01	.02	.03	.00	.01	.04	.07
	[−1.39]	[−1.26]	[.80]	[−.87]	[.53]	[.80]	[1.84]	[−.50]	[.51]	[1.89]	[1.86]
e_i^q	−.64	−2.78	−.18	−1.33	.70	.00	2.18	−1.55	2.49	1.09	1.74
	[−.47]	[−1.65]	[−.21]	[−.80]	[.57]	[.00]	[1.76]	[−1.13]	[1.52]	[.66]	[.89]
	10 B/M Portfolios										
$e_i^{\sigma^2}$	.06	.05	.05	.02	.02	.02	.01	−.01	−.02	−.08	−.14
	[2.11]	[2.14]	[2.26]	[.93]	[.95]	[1.09]	[.66]	[−.52]	[−1.38]	[−1.93]	[−2.13]
e_i^q	−1.81	−1.36	−1.10	−1.17	.02	1.58	3.67	2.02	1.80	−2.34	−.53
	[−.84]	[−.79]	[−.77]	[−.65]	[.01]	[.81]	[1.94]	[1.05]	[.92]	[−1.05]	[−.18]
	10 CI Portfolios										
$e_i^{\sigma^2}$	−.01	.00	.04	.03	.03	.03	.02	.02	−.03	−.06	−.05
	[−.32]	[.09]	[1.72]	[1.12]	[1.32]	[1.76]	[1.19]	[1.26]	[−1.80]	[−1.73]	[−1.54]
e_i^q	1.98	−.91	2.32	2.79	1.94	1.77	−.32	−.96	−2.96	−6.33	−8.31
	[.60]	[−.55]	[1.17]	[1.45]	[1.40]	[.86]	[−.20]	[−.52]	[−1.45]	[−2.13]	[−2.11]

Note.— We value-weight all portfolio stock returns, r_{it}^S, and corporate bond returns, r_{it}^B. Estimates and tests are from the one-stage GMM estimation with an identity weighting matrix. In panel A the moment conditions are $E[r_{it+1}^S - r_{it+1}^{Iw}] = 0$. The expected return errors are defined as $e_i^q \equiv E_T[r_{it+1}^S - r_{it+1}^{Iw}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets. In panel B the moment conditions are $E[r_{it+1}^S - r_{it+1}^{Iw}] = 0$ and $E[(r_{it+1}^S - E[r_{it+1}^S])^2 - (r_{it+1}^{Iw} - E[r_{it+1}^{Iw}])^2] = 0$. The variance errors are defined as $e_i^{\sigma^2} \equiv E_T[(r_{it+1}^S - E_T[r_{it+1}^S])^2 - (r_{it+1}^{Iw} - E_T[r_{it+1}^{Iw}])^2]$. The expected return errors are defined as in panel A. In the last column we report the difference in the expected return errors and the difference in the variance errors between the high and low portfolios, as well as their t-statistics. Expected return errors are in annual percent, and variance errors are in annual decimals.

Table D11
Parameter Estimates and Tests of Overidentification, Window Length of One in the Standard Bartlett Kernel

	SUE	B/M	CI
	A. Matching Expected Returns		
a	7.68	22.34	.97
	[2.35]	[25.74]	[.42]
α	.32	.50	.21
	[.04]	[.29]	[.02]
χ^2	6.57	7.65	13.94
d.f.	8	8	8

p	.58	.47	.08
m.a.e.	.74	2.32	1.51
	B. Matching Expected Returns and Variances		
a	28.88	11.48	16.23
	[17.52]	[4.30]	[6.07]
α	.61	.35	.36
	[.27]	[.07]	[.09]
$\chi^2_{(2)}$	9.18	14.20	13.08
d.f.(2)	8	8	8
$p(2)$	.33	.08	.11
m.a.e.(2)	.03	.04	.02
$\chi^2_{(1)}$	7.50	9.09	6.88
d.f.(1)	8	8	8
$p(1)$	.48	.33	.55
m.a.e.(1)	3.45	2.58	2.22
χ^2	10.55	15.52	14.03
d.f.	18	18	18
p	.91	.63	.73

Note.—Estimates and tests are from the one-stage GMM estimation with an identity weighting matrix. We use a standard Bartlett kernel with a window length of one to calculate the optimal weighting matrix when conducting inferences. In panel A the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$. a is the adjustment cost parameter and α is capital's share. Their standard errors are reported in brackets beneath the estimates. χ^2 is the statistic from the second-stage GMM that the moment conditions are jointly zero. d.f. is the degrees of freedom, and p is the p-value associated with the test. m.a.e. is the mean absolute error, $E_T[r^S_{it+1} - r^{Iw}_{it+1}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets, in annual percent across a given set of testing portfolios. In panel B the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$ and $E[(r^S_{it+1} - E[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E[r^{Iw}_{it+1}])^2] = 0$. $\chi^2_{(2)}$, d.f.(2), and $p(2)$ are the statistic, degrees of freedom, and p-value for the χ^2 test that the variance errors, defined as $E_T[(r^S_{it+1} - E_T[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E_T[r^{Iw}_{it+1}])^2]$, are jointly zero. m.a.e.(2) is the mean absolute variance error in annual decimals. $\chi^2_{(1)}$, d.f.(1), and $p(1)$ are the statistic, degrees of freedom, and p-value for the χ^2 test that the expected return errors, defined in the same way as in panel A, are jointly zero. m.a.e.(1) is mean absolute expected return error in annual percent. χ^2, d.f., and p are the statistic, degrees of freedom, and p-value of the test that both the expected return errors and the variance errors are jointly zero.

Table D12
Euler Equation Errors, Window Length of One in the Standard Bartlett Kernel

	Low	2	3	4	5	6	7	8	9	High	H−L
	A. Euler Equation Errors from Matching Expected Returns 10 SUE Portfolios										
e^q_i	.26	−1.72	−.05	.72	1.66	.51	.61	−1.25	−.50	−.15	−.40
	[.56]	[−2.14]	[−.07]	[.99]	[1.68]	[.58]	[.73]	[−1.39]	[−.52]	[−.14]	[−.44]
	10 B/M Portfolios										
e^q_i	−3.94	−3.20	−1.02	2.74	2.35	3.07	2.51	1.62	.05	−2.73	1.21
	[−1.87]	[−1.72]	[−.70]	[1.75]	[1.45]	[1.30]	[1.22]	[.56]	[.03]	[−1.34]	[.75]
	10 CI Portfolios										
e^q_i	−.97	−2.71	−.50	.93	2.72	3.37	.94	.46	−1.02	−1.45	−.49
	[−.62]	[−2.58]	[−.60]	[1.01]	[2.20]	[2.94]	[.99]	[.56]	[−.83]	[−1.42]	[−.46]

	B. Euler Equation Errors from Matching Expected Returns and Variances 10 SUE Portfolios										
$e_i^{\sigma^2}$	−.04	−.04	.01	−.01	.02	.03	.04	.01	.02	.03	.08
	[−2.04]	[−2.00]	[.60]	[−.39]	[1.18]	[1.49]	[1.84]	[.66]	[.79]	[1.66]	[2.13]
e_i^q	−6.99	−6.50	−2.12	−1.62	2.60	1.79	2.27	1.48	3.75	5.38	12.37
	[−2.04]	[−2.54]	[−1.44]	[−.75]	[1.62]	[.86]	[1.29]	[.77]	[1.56]	[1.94]	[2.40]
	10 B/M Portfolios										
$e_i^{\sigma^2}$	.10	.07	.06	.01	.01	.02	.01	−.01	−.02	−.10	−.20
	[3.45]	[2.84]	[2.58]	[.61]	[.59]	[.88]	[.27]	[−.33]	[−1.00]	[−2.58]	[−3.40]
e_i^q	−6.46	−3.83	−2.11	−.04	1.71	2.60	3.54	3.11	1.85	−.58	5.89
	[−2.14]	[−1.62]	[−.93]	[−.02]	[.74]	[1.13]	[1.49]	[1.19]	[.73]	[−.13]	[1.00]
	10 CI Portfolios										
$e_i^{\sigma^2}$	.01	.00	.02	.01	.03	.02	.02	.02	−.02	−.06	−.07
	[.34]	[−.18]	[1.26]	[.56]	[1.64]	[1.22]	[.84]	[1.01]	[−.98]	[−2.01]	[−1.41]
e_i^q	1.29	−2.51	−.11	1.86	3.47	3.48	1.12	.28	−2.82	−5.32	−6.60
	[.42]	[−1.12]	[−.05]	[1.04]	[1.93]	[1.91]	[.75]	[.16]	[−1.11]	[−1.49]	[−1.31]

Note.—Estimates and tests are from the one-stage GMM estimation with an identity weighting matrix. We use a standard Bartlett kernel with a window length of one to calculate the optimal weighting matrix when conducting inferences. In panel A the moments are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$. The expected return errors are defined as $e^q_i \equiv E_T[r^S_{it+1} - r^{Iw}_{it+1}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets. In panel B the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$ and $E[(r^S_{it+1} - E[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E[r^{Iw}_{it+1}])^2] = 0$. The variance errors are defined as $e^{\sigma^2}_i \equiv E_T[(r^S_{it+1} - E_T[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E_T[r^{Iw}_{it+1}])^2]$. The expected return errors are defined as in panel A. In the last column we report the difference in the expected return errors and the difference in the variance errors between the high and low portfolios, and their t-statistics. Expected return errors are in annual percent, and variance errors are in annual decimals.

Table D13

Parameter Estimates and Tests of Overidentification, Window Length of 10 in the Standard Bartlett Kernel

	SUE	B/M	CI
	A. Matching Expected Returns		
a	7.68	22.34	.97
	[1.51]	[24.41]	[.30]
α	.32	.50	.21
	[.03]	[.29]	[.01]
χ^2	.70	4.18	3.99
d.f.	8	8	8
p	1.00	.84	.86
m.a.e.	.74	2.32	1.51
	B. Matching Expected Returns and Variances		
a	28.88	11.48	16.23
	[11.54]	[4.24]	[4.22]
α	.61	.35	.36
	[.20]	[.06]	[.06]
$\chi^2_{(2)}$	3.08	3.44	3.38
d.f.(2)	8	8	8
$p(2)$	.93	.90	.91
m.a.e.(2)	.03	.04	.02
$\chi^2_{(1)}$	3.23	3.16	2.83
d.f.(1)	8	8	8
$p(1)$	.92	.92	.95
m.a.e.(1)	3.45	2.58	2.22

χ^2	2.79	3.42	3.96
d.f.	18	18	18
p	1.00	1.00	1.00

Note.—Estimates and tests are from the one-stage GMM estimation with an identity weighting matrix. We use a standard Bartlett kernel with a window length of 10 to calculate the optimal weighting matrix when conducting inferences. In panel A the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$. a is the adjustment cost parameter and α is capital's share. Their standard errors are reported in brackets beneath the estimates. χ^2 is the statistic from the second-stage GMM that the moment conditions are jointly zero. d.f. is the degrees of freedom, and p is the p-value associated with the test. m.a.e. is the mean absolute error, $E[r^S_{it+1} - r^{Iw}_{it+1}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets, in annual percent across a given set of testing portfolios. In panel B the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$ and $E[(r^S_{it+1} - E[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E[r^{Iw}_{it+1}])^2] = 0$. $\chi^2_{(2)}$, d.f.(2), and $p(2)$ are the statistic, degrees of freedom, and p-value for the χ^2 test that the variance errors, defined as $E_T[(r^S_{it+1} - E_T[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E_T[r^{Iw}_{it+1}])^2]$, are jointly zero. m.a.e.(2) is the mean absolute variance error in annual decimals. $\chi^2_{(1)}$, d.f.(1), and $p(1)$ are the statistic, degrees of freedom, and p-value for the χ^2 test that the expected return errors, defined in the same way as in panel A, are jointly zero. m.a.e.(1) is the mean absolute expected return error in annual percent. χ^2, d.f., and p are the statistic, degrees of freedom, and p-value of the test that both the expected return errors and the variance errors are jointly zero.

Table D14
Euler Equation Errors, Window Length of 10 in the Standard Bartlett Kernel

	Low	2	3	4	5	6	7	8	9	High	H−L
	A. Euler Equation Errors from Matching Expected Returns										
	10 SUE Portfolios										
e^q_i	.26	−1.72	−.05	.72	1.66	.51	.61	−1.25	−.50	−.15	−.40
	[.82]	[−1.53]	[−.12]	[.96]	[1.43]	[.86]	[.90]	[−1.07]	[−.59]	[−.20]	[−.49]
	10 B/M Portfolios										
e^q_i	−3.94	−3.20	−1.02	2.74	2.35	3.07	2.51	1.62	.05	−2.73	1.21
	[−1.51]	[−1.39]	[−.78]	[1.15]	[1.34]	[1.16]	[1.28]	[.59]	[.03]	[−1.20]	[1.01]
	10 CI Portfolios										
e^q_i	−.97	−2.71	−.50	.93	2.72	3.37	.94	.46	−1.02	−1.45	−.49
	[−.50]	[−1.60]	[−.59]	[1.04]	[1.58]	[1.69]	[.76]	[.90]	[−1.01]	[−1.10]	[−.46]
	B. Euler Equation Errors from Matching Expected Returns and Variances										
	10 SUE Portfolios										
$e^{\sigma^2}_i$	−.04	−.04	.01	−.01	.02	.03	.04	.01	.02	.03	.08
	[−1.65]	[−1.57]	[.88]	[−.36]	[.85]	[1.41]	[1.43]	[.95]	[.69]	[1.34]	[1.52]
e^q_i	−6.99	−6.50	−2.12	−1.62	2.60	1.79	2.27	1.48	3.75	5.38	12.37
	[−1.78]	[−1.76]	[−1.25]	[−1.12]	[1.66]	[1.25]	[1.73]	[.87]	[1.53]	[1.64]	[1.80]
	10 B/M Portfolios										
$e^{\sigma^2}_i$	.10	.07	.06	.01	.01	.02	.01	−.01	−.02	−.10	−.20
	[1.83]	[1.83]	[1.73]	[.81]	[.47]	[.90]	[.31]	[−.47]	[−1.36]	[−1.69]	[−1.83]
e^q_i	−6.46	−3.83	−2.11	−.04	1.71	2.60	3.54	3.11	1.85	−.58	5.89
	[−1.55]	[−1.58]	[−1.06]	[−.02]	[.91]	[1.37]	[1.65]	[1.40]	[1.27]	[−.14]	[.98]
	10 CI Portfolios										
$e^{\sigma^2}_i$	.01	.00	.02	.01	.03	.02	.02	.02	−.02	−.06	−.07
	[.34]	[−.15]	[1.09]	[.51]	[1.47]	[1.04]	[.67]	[1.06]	[−1.46]	[−1.42]	[−1.11]
e^q_i	1.29	−2.51	−.11	1.86	3.47	3.48	1.12	.28	−2.82	−5.32	−6.60
	[.63]	[−1.57]	[−.10]	[1.36]	[1.66]	[1.67]	[.97]	[.28]	[−1.63]	[−1.69]	[−1.97]

Note.—Estimates and tests are from the one-stage GMM estimation with an identity weighting matrix. We use a standard Bartlett kernel with a window length of 10 to calculate the optimal weighting matrix when conducting inferences. In panel A the moments are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$. The expected return errors are defined as $e^q_i \equiv E_T[r^S_{it+1} - r^{Iw}_{it+1}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets. In panel B the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$ and $E[(r^S_{it+1} - E[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E[r^{Iw}_{it+1}])^2] = 0$. The variance errors are defined as $e^{\sigma^2}_i \equiv E_T[(r^S_{it+1} - E_T[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E_T[r^{Iw}_{it+1}])^2]$. The expected return errors are defined as in panel A. In the last column we report the difference in the expected return errors and the difference in the variance errors between the high and low portfolios, and their t-statistics. Expected return errors are in annual percent, and variance errors are in annual decimals.

Table D15
Parameter Estimates and Tests of Overidentification, an Alternative Measure of Capital

	SUE	B/M	CI
	A. Matching Expected Returns		
a	3.68	8.21	.41
	[.92]	[7.88]	[.16]
α	.20	.26	.14
	[.02]	[.10]	[.01]
χ^2	3.94	6.33	6.20
d.f.	8	8	8
p	.86	.61	.63
m.a.e.	.67	2.48	1.46
	B. Matching Expected Returns and Variances		
a	13.32	5.58	8.10
	[7.05]	[2.27]	[2.48]
α	.34	.22	.23
	[.13]	[.04]	[.04]
$\chi^2_{(2)}$	4.99	6.25	5.05
d.f.(2)	8	8	8
p(2)	.76	.62	.75
m.a.e.(2)	.03	.04	.02
$\chi^2_{(1)}$	5.24	5.11	6.00
d.f.(1)	8	8	8
p(1)	.73	.75	.65
m.a.e.(1)	3.35	3.08	2.45
χ^2	6.28	6.80	6.09
d.f.	18	18	18
p	1.00	.99	1.00

Note.—Estimates and tests are from the one-stage GMM estimation with an identity weighting matrix. We measure the capital stock, K_{it}, as net property, plant, and equipment (Compustat annual item 7). In panel A the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$. a is the adjustment cost parameter and α is capital's share. Their standard errors are reported in brackets beneath the estimates. χ^2 is the statistic from the second-stage GMM that the moment conditions are jointly zero. d.f. is the degrees of freedom, and p is the p-value associated with the test. m.a.e. is the mean absolute error, $E_T[r^S_{it+1} - r^{Iw}_{it+1}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets, in annual percent across a given set of testing portfolios. In panel B the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$ and $E[(r^S_{it+1} - E[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E[r^{Iw}_{it+1}])^2] = 0$. $\chi^2_{(2)}$, d.f.(2), and $p(2)$ are the statistic, degrees of freedom, and p-value for the χ^2 test that the variance errors, defined as $E_T[(r^S_{it+1} - E_T[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E_T[r^{Iw}_{it+1}])^2]$, are jointly zero. m.a.e.(2) is the mean absolute variance error in annual decimals. $\chi^2_{(1)}$, d.f.(1), and $p(1)$ are the statistic, degrees of freedom, and p-value for the χ^2 test that the expected return errors, defined in the same way as in panel A, are jointly zero. m.a.e.(1) is the mean absolute expected return error in annual percent. χ^2, d.f., and p are the statistic, degrees of freedom, and p-value of the test that both the expected return errors and the variance errors are jointly zero.

Table D16

Euler Equation Errors, an Alternative Measure of Capital

	Low	2	3	4	5	6	7	8	9	High	H−L
				A. Euler Equation Errors from Matching Expected Returns							
				10 SUE Portfolios							
e^q_i	.09	−1.47	.24	.52	1.50	.61	.41	−1.19	−.50	−.18	−.27
	[.21]	[−1.63]	[.30]	[.72]	[1.50]	[.79]	[.65]	[−1.07]	[−.55]	[−.18]	[−.28]
				10 B/M Portfolios							
e^q_i	−3.99	−3.24	−.82	2.81	2.55	3.47	2.72	1.79	−.58	−2.85	1.14
	[−1.92]	[−1.64]	[−.54]	[1.53]	[1.52]	[1.25]	[1.38]	[.64]	[−.32]	[−1.27]	[.59]
				10 CI Portfolios							
e^q_i	.81	−3.39	−1.28	.04	2.53	3.54	.83	.14	−1.25	−.80	−1.60
	[.38]	[−2.02]	[−1.46]	[.04]	[1.39]	[1.85]	[.55]	[.23]	[−1.00]	[−.59]	[−1.13]
				B. Euler Equation Errors from Matching Expected Returns and Variances							
				10 SUE Portfolios							
$e^{\sigma^2}_i$	−.05	−.03	.00	.01	.01	.03	.04	.03	.03	.02	.08
	[−1.80]	[−1.82]	[−.17]	[.34]	[.86]	[1.61]	[1.53]	[1.79]	[1.46]	[.91]	[1.56]
e^q_i	−6.95	−6.60	−2.16	−1.22	2.81	1.53	2.10	1.48	3.91	4.77	11.72
	[−2.25]	[−2.27]	[−1.49]	[−.89]	[1.99]	[1.14]	[1.67]	[.82]	[1.79]	[1.97]	[2.57]
				10 B/M Portfolios							
$e^{\sigma^2}_i$	.10	.07	.06	.00	.00	.02	.03	−.02	−.01	−.11	−.21
	[2.29]	[1.93]	[2.07]	[.11]	[.11]	[.87]	[.91]	[−.57]	[−.74]	[−2.01]	[−2.37]
e^q_i	−6.90	−4.69	−3.28	−.56	2.05	2.84	3.53	3.77	2.91	.26	7.16
	[−2.03]	[−1.92]	[−1.41]	[−.29]	[.99]	[1.27]	[1.80]	[1.66]	[1.57]	[.06]	[1.17]
				10 CI Portfolios							
$e^{\sigma^2}_i$	.05	−.01	.01	−.01	−.01	−.01	.01	.02	−.02	−.04	−.09
	[1.63]	[−.73]	[.37]	[−.28]	[−.20]	[−.35]	[.65]	[1.33]	[−1.17]	[−1.46]	[−1.74]
e^q_i	3.37	−2.30	−.49	1.40	3.64	3.10	1.15	−.47	−3.65	−4.92	−8.29
	[1.21]	[−1.43]	[−.36]	[.83]	[1.71]	[1.62]	[.82]	[−.36]	[−1.85]	[−1.99]	[−2.24]

Note.—Estimates and tests are from the one-stage GMM estimation with an identity weighting matrix. We measure the capital stock, K_{it}, as net property, plant, and equipment (Compustat annual item 7). In panel A the moments are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$. The expected return errors are defined as $e^q_i \equiv E_T[r^S_{it+1} - r^{Iw}_{it+1}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets. In panel B the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$ and $E[(r^S_{it+1} - E[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E[r^{Iw}_{it+1}])^2] = 0$. The variance errors are defined as $e^{\sigma^2}_i \equiv E_T[(r^S_{it+1} - E_T[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E_T[r^{Iw}_{it+1}])^2]$. The expected return errors are defined as in panel A. In the last column we report the difference in the expected return errors and the difference in the variance errors between the high and low portfolios, and their *t*-statistics. Expected return errors are in annual percent, and variance errors are in annual decimals.

Table D17

Parameter Estimates and Tests of Overidentification, an Alternative Measure of Investment

	SUE	B/M	CI
	A. Matching Expected Returns		
a	8.50	47.10	1.01
	[1.84]	[93.66]	[.29]
α	.34	.84	.21
	[.04]	[1.19]	[.02]
χ^2	4.86	5.78	6.56
d.f.	8	8	8
p	.77	.67	.59
m.a.e.	.76	1.99	1.50
	B. Matching Expected Returns and Variances		
a	27.42	11.50	16.94
	[16.54]	[5.10]	[6.67]
α	.60	.35	.38
	[.28]	[.08]	[.09]
$\chi^2_{(2)}$	4.56	6.09	6.40
d.f.(2)	8	8	8
p(2)	.80	.64	.60
m.a.e.(2)	.02	.04	.02
$\chi^2_{(1)}$	5.22	4.48	4.74
d.f.(1)	8	8	8
p(1)	.73	.81	.79
m.a.e.(1)	3.39	2.50	2.16
χ^2	5.12	6.22	22.61
d.f.	18	18	18
p	1.00	1.00	.21

Note.—Estimates and tests are from the one-stage GMM estimation with an identity weighting matrix. We measure investment, I_{it}, as capital expenditures (Compustat annual item 128). In panel A the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$. a is the adjustment cost parameter and α is capital's share. Their standard errors are reported in brackets beneath the estimates. χ^2 is the statistic from the second-stage GMM that the moment conditions are jointly zero. d.f. is the degrees of freedom, and p is the p-value associated with the test. m.a.e. is the mean absolute error, $E_T[r^S_{it+1} - r^{Iw}_{it+1}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets, in annual percent across a given set of testing portfolios. In panel B the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$ and $E[(r^S_{it+1} - E[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E[r^{Iw}_{it+1}])^2] = 0$. $\chi^2_{(2)}$, d.f.(2), and p(2) are the statistic, degrees of freedom, and p-value for the χ^2 test that the variance errors, defined as $E_T[(r^S_{it+1} - E_T[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E_T[r^{Iw}_{it+1}])^2]$, are jointly zero. m.a.e.(2) is the mean absolute variance error in annual decimals. $\chi^2_{(1)}$, d.f.(1), and p(1) are the statistic, degrees of freedom, and p-value for the χ^2 test that the expected return errors, defined in the same way as in panel A, are jointly zero. m.a.e.(1) is the mean absolute expected return error in annual percent. χ^2, d.f., and p are the statistic, degrees of freedom, and p-value of the test that both the expected return errors and the variance errors are jointly zero.

Table D18

Euler Equation Errors, an Alternative Measure of Investment

	Low	2	3	4	5	6	7	8	9	High	H−L
	A. Euler Equation Errors from Matching Expected Returns										
	10 SUE Portfolios										
e^q_i	.18	−1.66	−.04	.49	1.72	.79	.65	−1.57	−.40	−.10	−.28
	[.46]	[−1.87]	[−.04]	[.76]	[1.74]	[1.04]	[1.22]	[−1.33]	[−.49]	[−.11]	[−.30]
	10 B/M Portfolios										
e^q_i	−3.06	−2.60	.05	2.06	1.29	2.22	2.72	2.47	−.47	−2.95	.12
	[−1.64]	[−1.34]	[.04]	[1.25]	[.66]	[.73]	[1.29]	[.93]	[−.21]	[−1.19]	[.07]
	10 CI Portfolios										
e^q_i	−.91	−2.71	−.59	.87	2.75	3.35	.94	.44	−.93	−1.46	−.55
	[−.48]	[−1.95]	[−.72]	[.90]	[1.77]	[2.21]	[.76]	[.74]	[−.84]	[−1.24]	[−.45]
	B. Euler Equation Errors from Matching Expected Returns and Variances										
	10 SUE Portfolios										
$e^{\sigma^2}_i$	−.04	−.04	.01	.00	.02	.02	.02	.02	.01	.04	.08
	[−1.86]	[−1.94]	[.79]	[−.15]	[.96]	[1.05]	[1.04]	[1.13]	[.25]	[1.58]	[1.76]
e^q_i	−7.09	−6.40	−1.91	−1.56	2.61	1.75	2.13	1.72	3.45	5.28	12.37
	[−2.23]	[−2.26]	[−1.33]	[−1.03]	[1.91]	[1.12]	[1.68]	[1.00]	[1.66]	[2.01]	[2.50]
	10 B/M Portfolios										
$e^{\sigma^2}_i$	.10	.07	.06	.01	.01	.02	.01	−.01	−.02	−.10	−.20
	[1.83]	[1.83]	[1.73]	[.81]	[.47]	[.90]	[.31]	[−.47]	[−1.36]	[−1.69]	[−1.83]
e^q_i	−6.46	−3.83	−2.11	−.04	1.71	2.60	3.54	3.11	1.85	−.58	5.89
	[−1.55]	[−1.58]	[−1.06]	[−.02]	[.91]	[1.37]	[1.65]	[1.40]	[1.27]	[−.14]	[.98]
	10 CI Portfolios										
$e^{\sigma^2}_i$	.01	.01	.03	.02	.02	.01	.01	.02	−.03	−.06	−.07
	[.32]	[.63]	[1.49]	[.79]	[.79]	[.50]	[.61]	[1.16]	[−1.94]	[−1.83]	[−1.44]
e^q_i	1.69	−2.09	.02	1.96	3.22	3.17	.96	.10	−3.13	−5.28	−6.98
	[.62]	[−1.49]	[.02]	[1.23]	[1.85]	[1.73]	[.77]	[.09]	[−1.63]	[−2.00]	[−2.00]

Note.—Estimates and tests are from the one-stage GMM estimation with an identity weighting matrix. We measure investment, I_{it}, as capital expenditures (Compustat annual item 128). In panel A the moments are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$. The expected return errors are defined as $e^q_i \equiv E_T[r^S_{it+1} - r^{Iw}_{it+1}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets. In panel B the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$ and $E[(r^S_{it+1} - E[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E[r^{Iw}_{it+1}])^2] = 0$. The variance errors are defined as $e^{\sigma^2}_i \equiv E_T[(r^S_{it+1} - E_T[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E_T[r^{Iw}_{it+1}])^2]$. The expected return errors are defined as in panel A. In the last column we report the difference in the expected return errors and the difference in the variance errors between the high and low portfolios, and their *t*-statistics. Expected return errors are in annual percent, and variance errors are in annual decimals.

Table D19

Parameter Estimates and Tests of Overidentification, Time-Invariant Tax Rates

	SUE	B/M	CI
	A. Matching Expected Returns		
a	3.52	10.31	.44
	[.80]	[11.76]	[.12]
α	.29	.44	.17
	[.03]	[.29]	[.02]
χ^2	4.32	5.79	6.57
d.f.	8	8	8
p	.83	.67	.58
m.a.e.	.75	2.27	1.59
	B. Matching Expected Returns and Variances		
a	12.44	5.17	7.09
	[6.95]	[2.13]	[2.40]
α	.52	.30	.31
	[.22]	[.06]	[.06]
$\chi^2_{(2)}$	5.12	6.22	6.05
d.f.(2)	8	8	8
$p(2)$	.75	.62	.64
m.a.e.(2)	.02	.04	.02
$\chi^2_{(1)}$	5.33	4.41	4.91
d.f.(1)	8	8	8
$p(1)$	.72	.82	.77
m.a.e.(1)	3.46	2.63	2.26
χ^2	97.96	6.17	6.45
d.f.	18	18	18
p	.00	1.00	.99

Note.—Estimates and tests are from the one-stage GMM estimation with an identity weighting matrix. We measure the corporate tax rate, τ_{t+1}, as its sample mean of 42.3 percent from 1963 to 2005. In panel A the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$. a is the adjustment cost parameter and α is capital's share. Their standard errors are reported in brackets beneath the estimates. χ^2 is the statistic from the second-stage GMM that the moment conditions are jointly zero. d.f. is the degrees of freedom, and p is the p-value associated with the test. m.a.e. is the mean absolute error, $E_T[r^S_{it+1} - r^{Iw}_{it+1}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets, in annual percent across a given set of testing portfolios. In panel B the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$ and $E[(r^S_{it+1} - E[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E[r^{Iw}_{it+1}])^2] = 0$. $\chi^2_{(2)}$, d.f.(2), and $p(2)$ are the statistic, degrees of freedom, and p-value for the χ^2 test that the variance errors, defined as $E_T[(r^S_{it+1} - E_T[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E_T[r^{Iw}_{it+1}])^2]$, are jointly zero. m.a.e.(2) is the mean absolute variance error in annual decimals. $\chi^2_{(1)}$, d.f.(1), and $p(1)$ are the statistic, degrees of freedom, and p-value for the χ^2 test that the expected return errors, defined in the same way as in panel A, are jointly zero. m.a.e.(1) is the mean absolute expected return error in annual percent. χ^2, d.f., and p are the statistic, degrees of freedom, and p-value of the test that both the expected return errors and the variance errors are jointly zero.

Table D20
Euler Equation Errors, Time-Invariant Tax Rates

	Low	2	3	4	5	6	7	8	9	High	H−L
	A. Euler Equation Errors from Matching Expected Returns										
	10 SUE Portfolios										
e_i^q	.31	−1.75	−.12	.72	1.64	.53	.61	−1.24	−.52	−.09	−.40
	[.76]	[−1.79]	[−.15]	[.96]	[1.66]	[.74]	[1.08]	[−1.13]	[−.63]	[−.09]	[−.40]
	10 B/M Portfolios										
e_i^q	−3.90	−3.32	−.97	2.64	2.27	2.90	2.41	1.75	−.07	−2.50	1.40
	[−1.73]	[−1.42]	[−.63]	[1.33]	[1.36]	[1.04]	[1.25]	[.64]	[−.04]	[−1.30]	[.89]
	10 CI Portfolios										
e_i^q	−1.17	−2.66	−.48	1.03	2.85	3.55	1.02	.49	−1.04	−1.58	−.41
	[−.68]	[−1.98]	[−.59]	[1.08]	[1.80]	[2.32]	[.85]	[.83]	[−.99]	[−1.47]	[−.37]
	B. Euler Equation Errors from Matching Expected Returns and Variances										
	10 SUE Portfolios										
$e_i^{\sigma^2}$	−.04	−.04	.00	−.01	.02	.03	.04	.01	.02	.04	.08
	[−1.93]	[−1.91]	[.36]	[−.46]	[.81]	[1.40]	[1.65]	[1.05]	[.82]	[1.61]	[1.87]
e_i^q	−6.89	−6.53	−2.17	−1.58	2.62	1.85	2.27	1.53	3.77	5.40	12.29
	[−2.23]	[−2.28]	[−1.54]	[−1.05]	[1.92]	[1.37]	[1.84]	[.85]	[1.75]	[2.02]	[2.51]
	10 B/M Portfolios										
$e_i^{\sigma^2}$	.10	.07	.06	.01	.01	.02	.01	−.01	−.03	−.10	−.19
	[2.36]	[2.18]	[2.08]	[.52]	[.51]	[.80]	[.36]	[−.26]	[−1.39]	[−1.88]	[−2.35]
e_i^q	−6.54	−4.11	−2.21	−.34	1.57	2.48	3.38	3.28	1.93	−.44	6.10
	[−1.90]	[−1.79]	[−1.06]	[−.18]	[.89]	[1.24]	[1.71]	[1.52]	[1.16]	[−.12]	[1.14]
	10 CI Portfolios										
$e_i^{\sigma^2}$	.00	.00	.02	.01	.04	.02	.02	.02	−.02	−.06	−.06
	[.11]	[.02]	[.91]	[.56]	[1.44]	[1.33]	[.89]	[1.05]	[−1.36]	[−1.70]	[−1.15]
e_i^q	1.11	−2.42	−.16	1.99	3.67	3.67	1.23	.24	−2.82	−5.27	−6.38
	[.45]	[−1.53]	[−.13]	[1.20]	[2.02]	[1.89]	[.98]	[.18]	[−1.56]	[−1.99]	[−2.04]

Note.—Estimates and tests are from the one-stage GMM estimation with an identity weighting matrix. We measure the corporate tax rate, τ_{t+1}, as its sample mean of 42.3 percent from 1963 to 2005. In panel A the moments are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$. The expected return errors are defined as $e_i^q \equiv E_T[r^S_{it+1} - r^{Iw}_{it+1}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets. In panel B the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$ and $E[(r^S_{it+1} - E[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E[r^{Iw}_{it+1}])^2] = 0$. The variance errors are defined as $e_i^{\sigma^2} \equiv E_T[(r^S_{it+1} - E_T[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E_T[r^{Iw}_{it+1}])^2]$. The expected return errors are defined as in panel A. In the last column we report the difference in the expected return errors and the difference in the variance errors between the high and low portfolios, and their *t*-statistics. Expected return errors are in annual percent, and variance errors are in annual decimals.

Table D21
Parameter Estimates and Tests of Overidentification, Portfolio-Specific Tax Rates

	SUE	B/M	CI
	A. Matching Expected Returns		
a	8.22	15.48	.85
	[1.79]	[17.35]	[.30]
α	.31	.38	.19
	[.03]	[.19]	[.02]
χ^2	4.56	6.41	6.60
d.f.	8	8	8
p	.80	.60	.58

m.a.e.	.73	2.44	1.99
	B. Matching Expected Returns and Variances		
a	27.57	10.86	15.57
	[15.50]	[4.50]	[5.39]
α	.54	.31	.32
	[.23]	[.06]	[.07]
$\chi^2_{(2)}$	5.17	6.11	5.78
d.f.(2)	8	8	8
p(2)	.74	.64	.67
m.a.e.(2)	.03	.04	.02
$\chi^2_{(1)}$	5.25	4.28	5.01
d.f.(1)	8	8	8
p(1)	.73	.83	.76
m.a.e.(1)	3.58	2.62	2.43
χ^2	5.35	6.15	7.22
d.f.	18	18	18
p	1.00	1.00	.99

Note.—Estimates and tests are from the one-stage GMM estimation with an identity weighting matrix. To measure the portfolio-specific corporate tax rate, τ^i_{t+1}, we first construct firm-specific tax rates using the trichotomous variable approach of Graham (1996) and then take the value-weighted tax rates across all firms within a given portfolio i. In panel A the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$. a is the adjustment cost parameter and α is capital's share. Their standard errors are reported in brackets beneath the estimates. χ^2 is the statistic from the second-stage GMM that the moment conditions are jointly zero. d.f. is the degrees of freedom, and p is the p-value associated with the test. m.a.e. is the mean absolute error, $E_T[r^S_{it+1} - r^{Iw}_{it+1}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets, in annual percent across a given set of testing portfolios. In panel B the moment conditions are $E[r^S_{it+1} - r^{Iw}_{it+1}] = 0$ and $E[(r^S_{it+1} - E[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E[r^{Iw}_{it+1}])^2] = 0$. $\chi^2_{(2)}$, d.f.(2), and p(2) are the statistic, degrees of freedom, and p-value for the χ^2 test that the variance errors, defined as $E_T[(r^S_{it+1} - E_T[r^S_{it+1}])^2 - (r^{Iw}_{it+1} - E_T[r^{Iw}_{it+1}])^2]$, are jointly zero. m.a.e.(2) is the mean absolute variance error in annual decimals. $\chi^2_{(1)}$, d.f.(1), and p(1) are the statistic, degrees of freedom, and p-value for the χ^2 test that the expected return errors, defined in the same way as in panel A, are jointly zero. m.a.e.(1) is the mean absolute expected return error in annual percent. χ^2, d.f., and p are the statistic, degrees of freedom, and p-value of the test that both the expected return errors and the variance errors are jointly zero.

Table D22

Euler Equation Errors, Portfolio-Specific Tax Rates

	Low	2	3	4	5	6	7	8	9	High	H−L
	A. Euler Equation Errors from Matching Expected Returns										
	10 SUE Portfolios										
e^q_i	.25	−1.58	−.13	.58	1.46	.58	.73	−1.20	−.71	.08	−.17
[t]	[.61]	[−1.76]	[−.16]	[.80]	[1.64]	[.76]	[1.22]	[−1.10]	[−.82]	[.08]	[−.18]
	10 B/M Portfolios										
e^q_i	−4.13	−2.97	−.77	2.52	2.27	3.26	2.95	2.18	−.16	−3.13	1.00
	[−1.85]	[−1.37]	[−.58]	[1.30]	[1.43]	[1.26]	[1.54]	[.82]	[−.12]	[−1.56]	[.69]
	10 CI Portfolios										
e^q_i	−1.93	−3.17	−.15	1.46	3.35	4.09	1.52	1.03	−.80	−2.38	−.45
	[−.96]	[−1.94]	[−.19]	[1.37]	[1.91]	[2.34]	[1.10]	[1.53]	[−.70]	[−1.76]	[−.36]

	B. Euler Equation Errors from Matching Expected Returns and Variances 10 SUE Portfolios										
$e_i^{\sigma^2}$	−.05	−.04	.01	−.01	.02	.03	.04	.01	.01	.03	.08
	[−1.96]	[−1.92]	[.59]	[−.49]	[1.04]	[1.67]	[1.70]	[.90]	[.67]	[1.60]	[1.90]
e_i^q	−7.21	−6.49	−2.21	−1.77	2.47	1.97	2.52	1.72	3.74	5.69	12.89
	[−2.25]	[−2.28]	[−1.51]	[−1.14]	[1.90]	[1.40]	[1.94]	[.96]	[1.74]	[2.04]	[2.50]
	10 B/M Portfolios										
$e_i^{\sigma^2}$	.10	.08	.06	.02	.02	.02	.01	−.01	−.02	−.11	−.21
	[2.34]	[2.24]	[2.10]	[.74]	[.64]	[.97]	[.34]	[−.31]	[−1.08]	[−2.04]	[−2.41]
e_i^q	−6.03	−3.30	−1.45	.30	1.86	2.95	3.79	3.45	1.42	−1.64	4.38
	[−1.80]	[−1.50]	[−.71]	[.16]	[.97]	[1.35]	[1.82]	[1.52]	[.87]	[−.40]	[.79]
	10 CI Portfolios										
$e_i^{\sigma^2}$	.01	.00	.02	.01	.03	.02	.02	.02	−.02	−.07	−.08
	[.39]	[−.10]	[1.15]	[.55]	[1.36]	[1.16]	[.75]	[1.12]	[−1.07]	[−1.90]	[−1.48]
e_i^q	.10	−2.94	.22	2.29	4.04	4.14	1.66	.89	−2.40	−5.66	−5.77
	[.04]	[−1.69]	[.17]	[1.37]	[2.08]	[1.98]	[1.21]	[.65]	[−1.36]	[−1.99]	[−1.92]

Note.— Estimates and tests are from the one-stage GMM estimation with an identity weighting matrix. To measure the portfolio-specific corporate tax rate, τ_{t+1}^i, we first construct firm-specific tax rates using the trichotomous variable approach of Graham (1996) and then take the value-weighted tax rates across all firms within a given portfolio i. In panel A the moments are $E[r_{it+1}^S - r_{it+1}^{Iw}] = 0$. The expected return errors are defined as $e_i^q \equiv E_T[r_{it+1}^S - r_{it+1}^{Iw}]$, in which $E_T[\cdot]$ is the sample mean of the series in brackets. In panel B the moment conditions are $E[r_{it+1}^S - r_{it+1}^{Iw}] = 0$ and $E[(r_{it+1}^S - E[r_{it+1}^S])^2 - (r_{it+1}^{Iw} - E[r_{it+1}^{Iw}])^2] = 0$. The variance errors are defined as $e_i^{\sigma^2} \equiv E_T[(r_{it+1}^S - E_T[r_{it+1}^S])^2 - (r_{it+1}^{Iw} - E_T[r_{it+1}^{Iw}])^2]$. The expected return errors are defined as in panel A. In the last column we report the difference in the expected return errors and the difference in the variance errors between the high and low portfolios and their t-statistics. Expected return errors are in annual percent, and variance errors are in annual decimals.

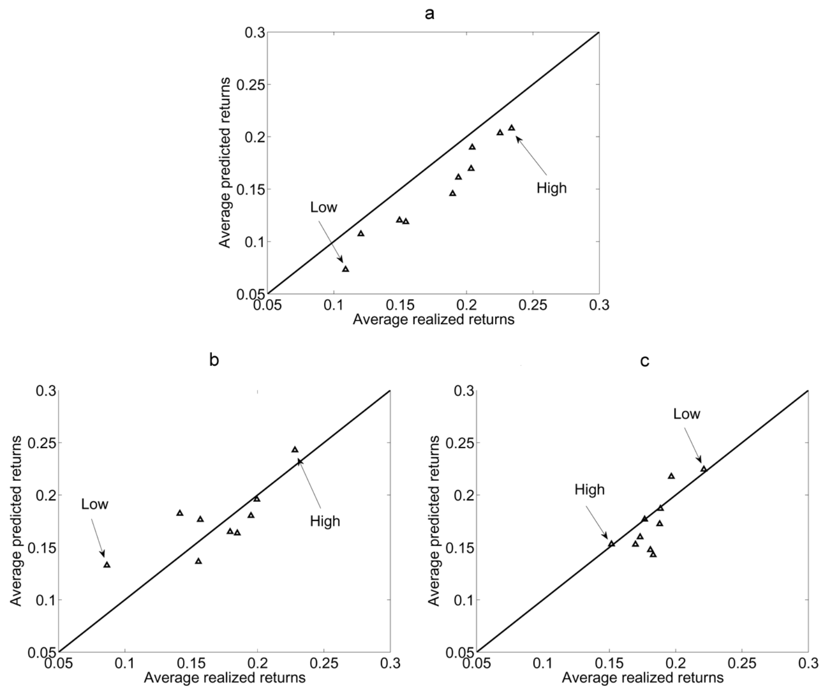

Fig. D1.— Average predicted stock returns versus average realized stock returns, the *q*-theory model, matching only expected stock returns, second-stage GMM. Figures D1*a*, D1*b*, and D1*c* report the results for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively. High denotes the high decile and low denotes the low decile.

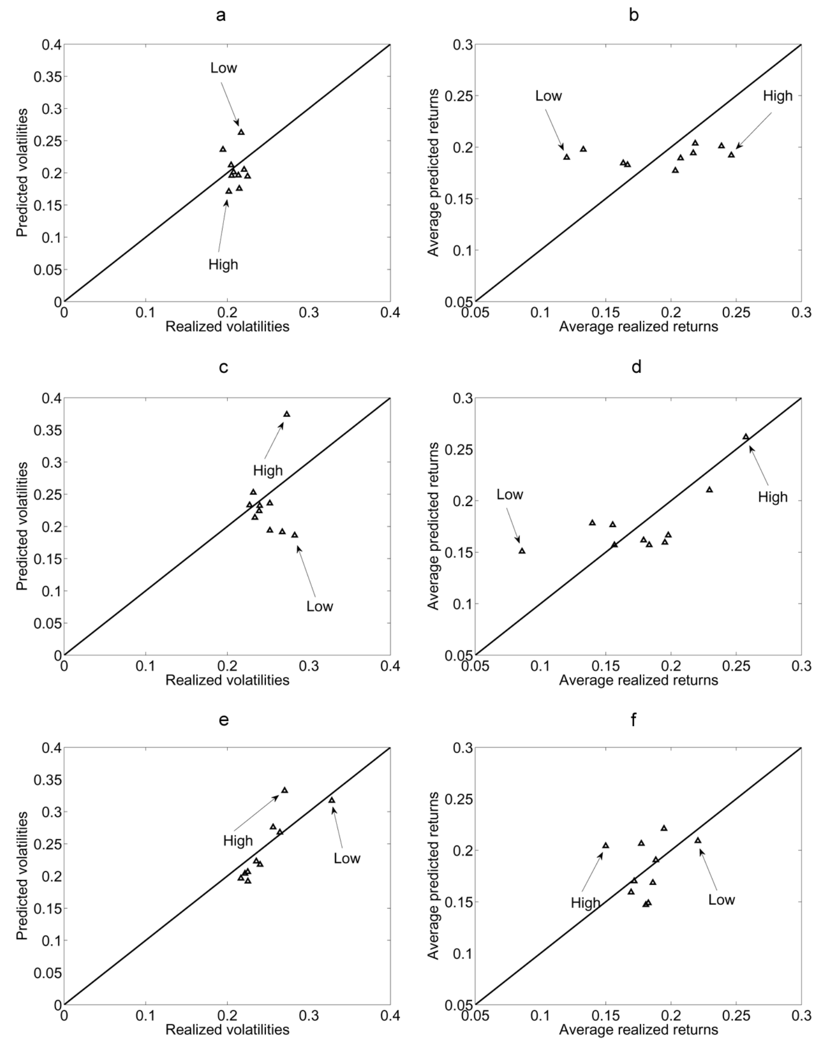

Fig. D2.— Predicted stock return volatilities versus realized stock return volatilities, average predicted stock returns versus average realized stock returns, the *q*-theory model, matching expected returns and variances simultaneously, second-stage GMM. Figures D2*a*, D2*c*, and D2*e* report the volatility plots for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively. Figures D2*b*, D2*d*, and D2*f* report the expected return plots for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively.

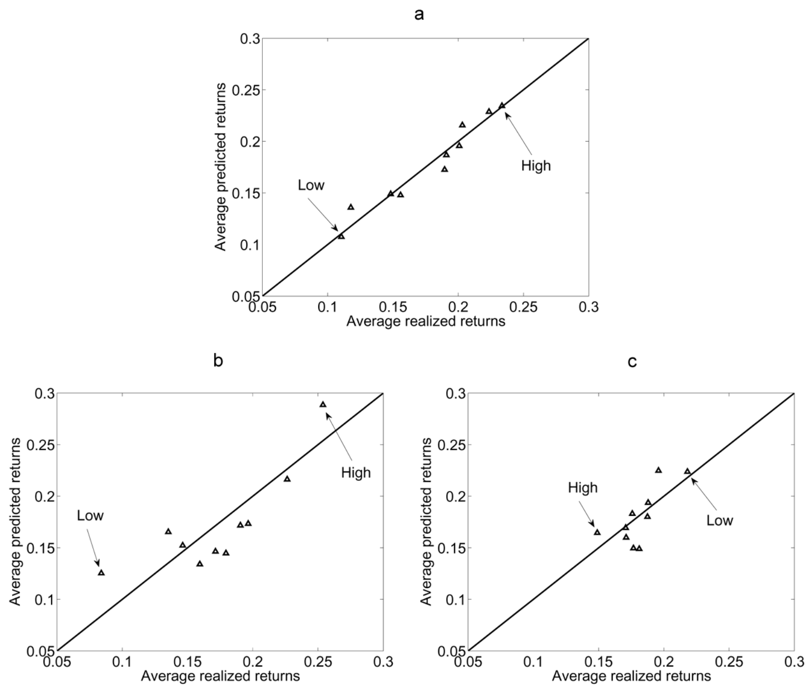

Fig. D3.— Average predicted stock returns versus average realized stock returns, the *q*-theory model, matching only expected stock returns, the market value of debt per the Bernanke and Campbell (1988) algorithm. Figures D3*a*, D3*b*, and D3*c* report the results for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively. High denotes the high decile and low denotes the low decile.

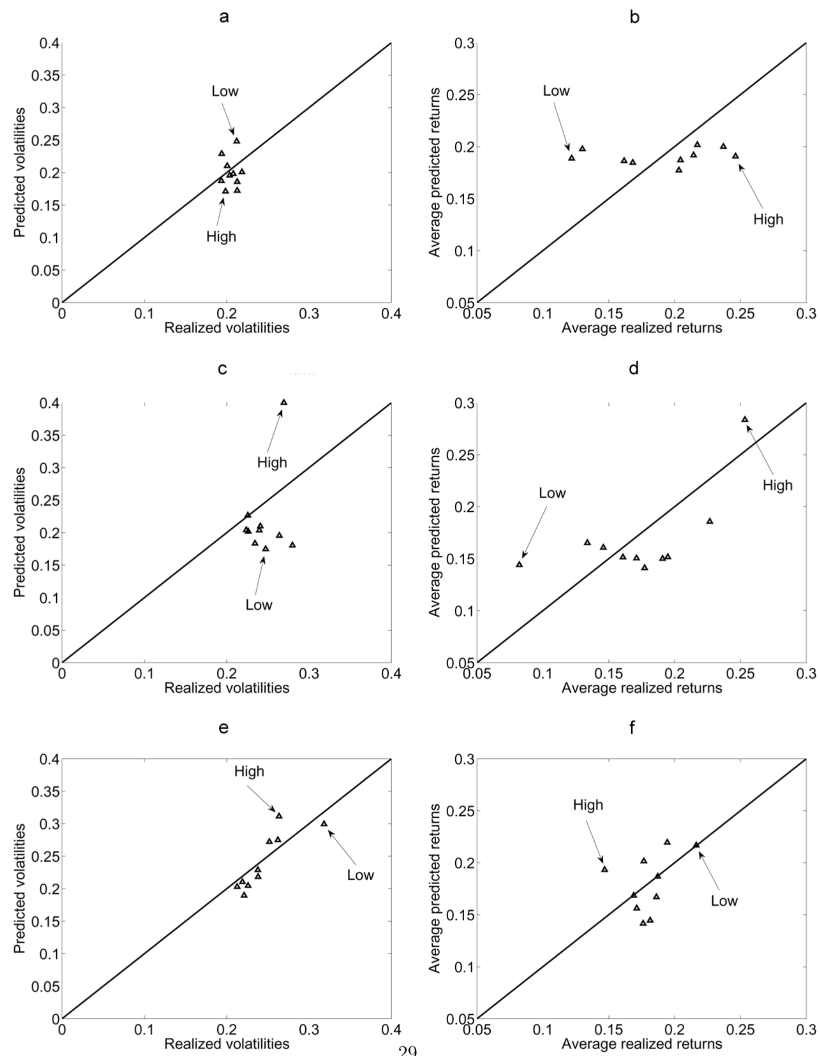

Fig. D4.— Predicted stock return volatilities versus realized stock return volatilities, average predicted stock returns versus average realized stock returns, the *q*-theory model, matching expected returns and variances simultaneously, the market value of debt per the Bernanke and Campbell (1988) algorithm. Figures D4*a*, D4*c*, and D4*e* report the volatility plots for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively. Figures D4*b*, D4*d*, and D4*f* report the expected return plots for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively.

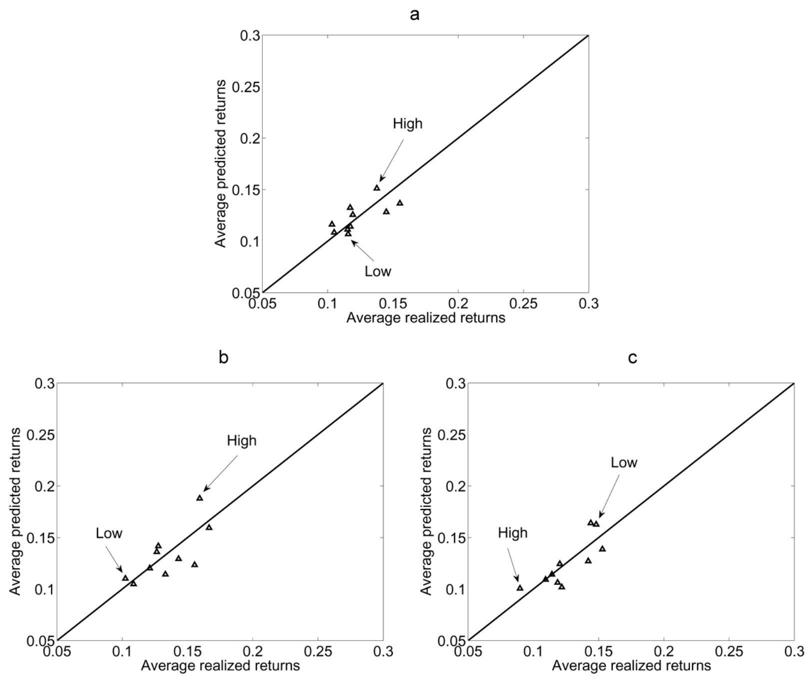

Fig. D5.— Average predicted stock returns versus average realized stock returns, the q-theory model, matching only expected stock returns, value-weighted returns. Figures D5*a*, D5*b*, and D5*c* report the results for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively. High denotes the high decile and low denotes the low decile.

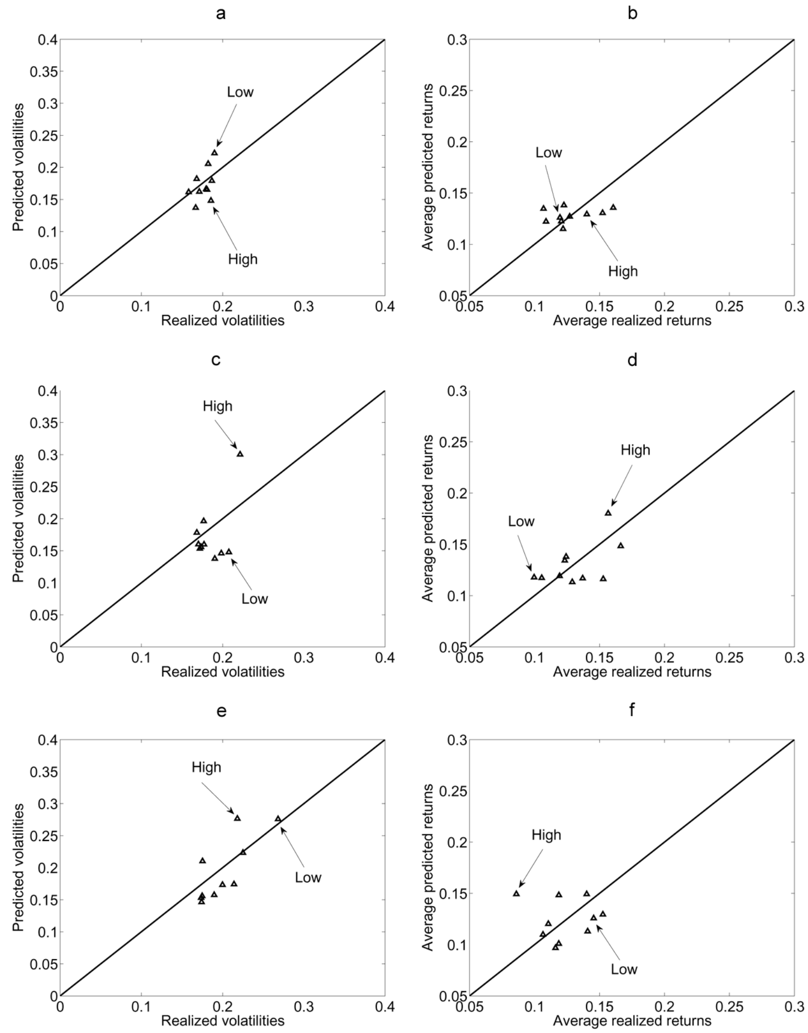

Fig. D6.— Predicted stock return volatilities versus realized stock return volatilities, average predicted stock returns versus average realized stock returns, the *q*-theory model, matching expected returns and variances simultaneously, value-weighted returns. Figures D6*a*, D6*c*, and D6*e* report the volatility plots for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively. Figures D6*b*, D6*d*, and D6*f* report the expected return plots for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively.

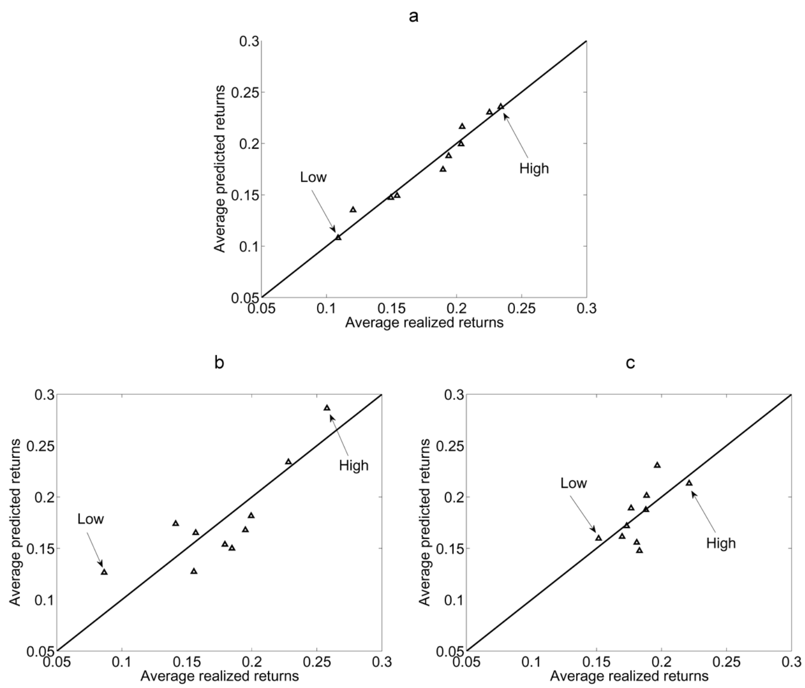

Fig. D7.— Average predicted stock returns versus average realized stock returns, the *q*-theory model, matching only expected stock returns, an alternative measure of capital. Figures D7*a*, D7*b*, and D7*c* report the results for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively. High denotes the high decile and low denotes the low decile.

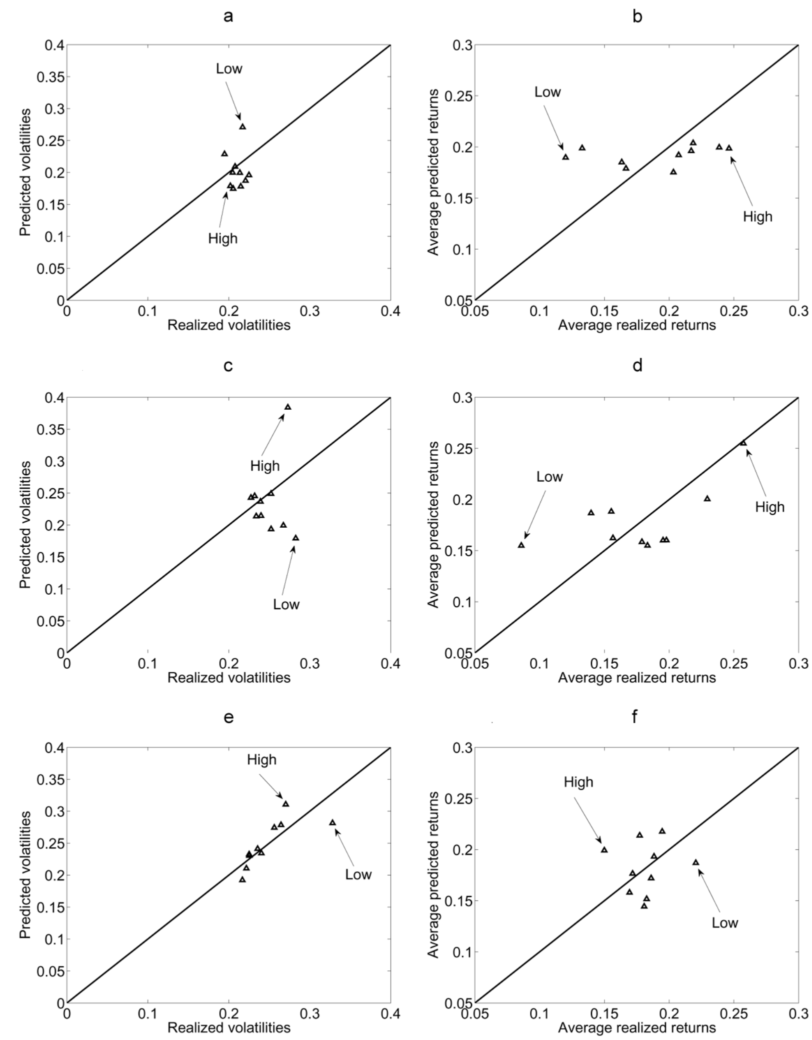

Fig. D8.— Predicted stock return volatilities versus realized stock return volatilities, average predicted stock returns versus average realized stock returns, the *q*-theory model, matching expected returns and variances simultaneously, an alternative measure of capital. Figures D8*a*, D8*c*, and D8*e* report the volatility plots for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively. Figures D8*b*, D8*d*, and D8*f* report the expected return plots for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively.

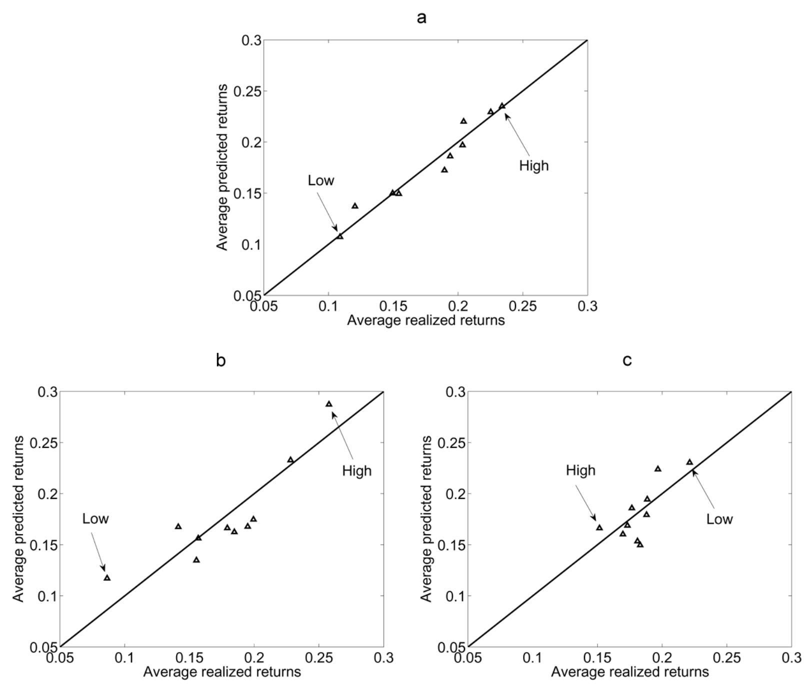

Fig. D9.— Average predicted stock returns versus average realized stock returns, the *q*-theory model, matching only expected stock returns, an alternative measure of investment. Figures D9*a*, D9*b*, and D9*c* report the results for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively. High denotes the high decile and low denotes the low decile.

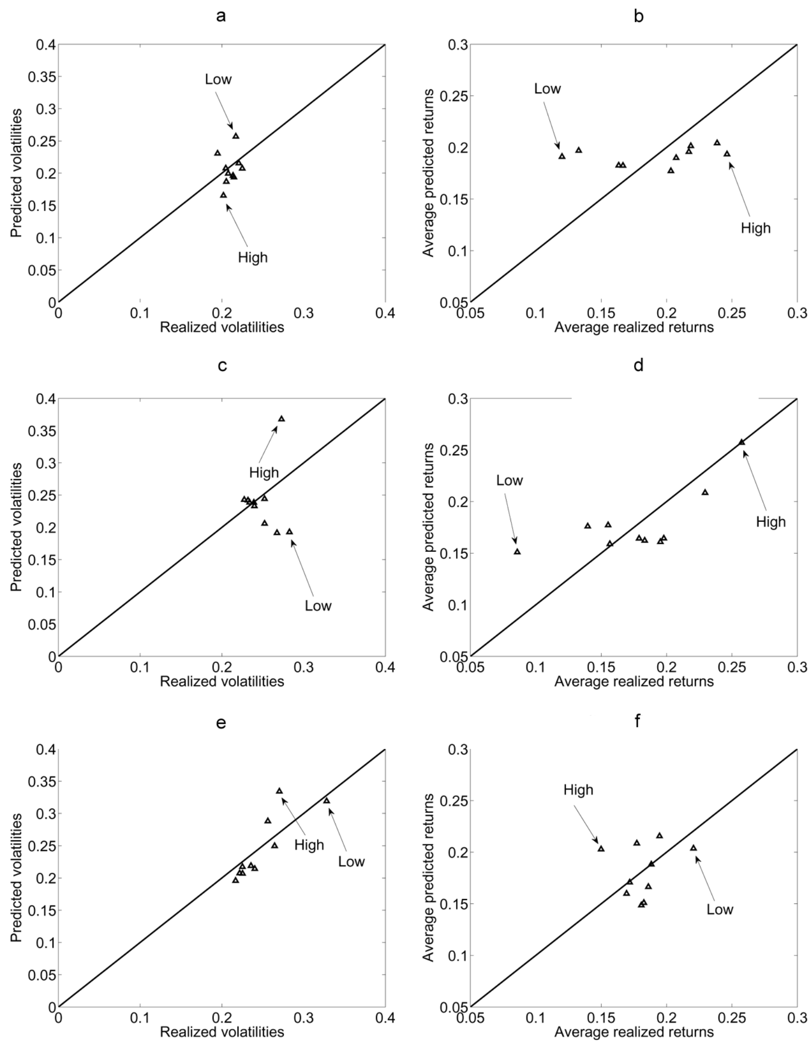

Fig. D10.— Predicted stock return volatilities versus realized stock return volatilities, average predicted stock returns versus average realized stock returns, the *q*-theory model, matching expected returns and variances simultaneously, an alternative measure of investment. Figures D10*a*, D10*c*, and D10*e* report the volatility plots for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively. Figures D10*b*, D10*d*, and D10*f* report the expected return plots for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively.

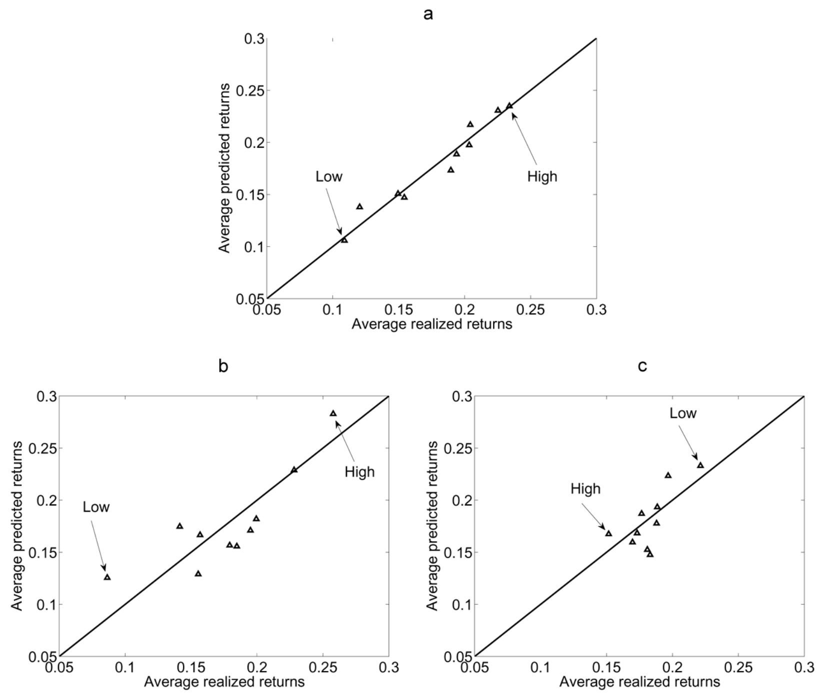

Fig. D11.— Average predicted stock returns versus average realized stock returns, the *q*-theory model, matching only expected stock returns, time-invariant tax rates. Figures D11*a*, D11*b*, and D11*c* report the results for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively. High denotes the high decile and low denotes the low decile.

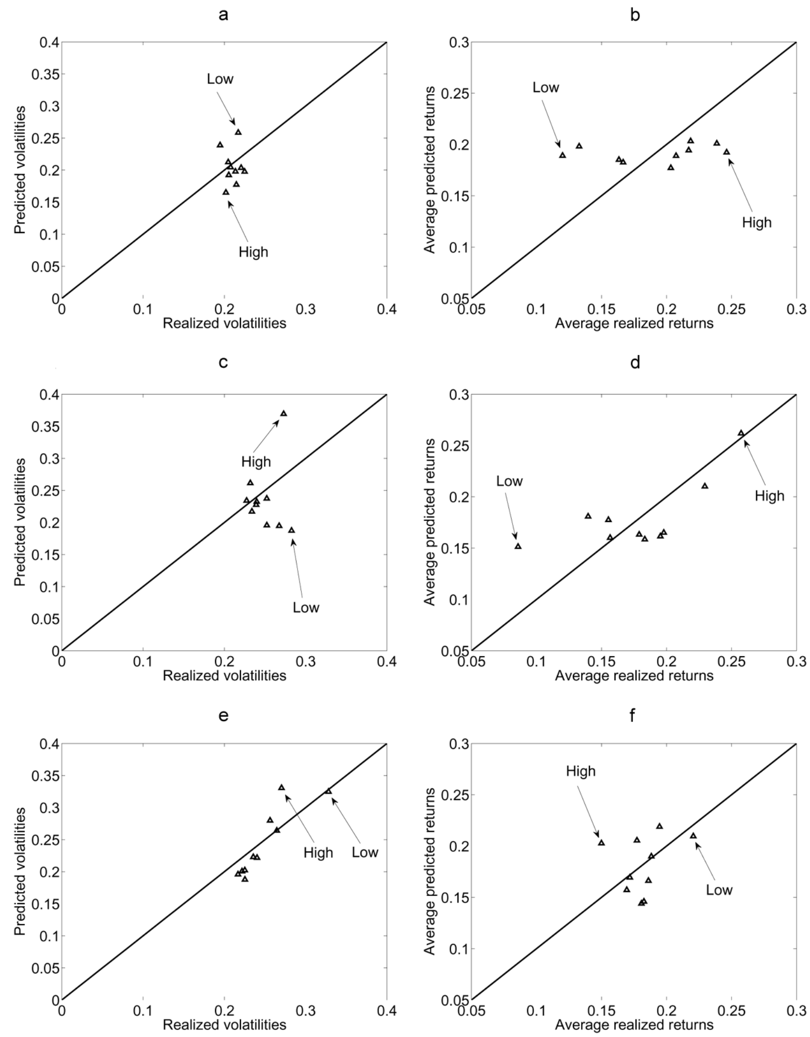

Fig. D12.— Predicted stock return volatilities versus realized stock return volatilities, average predicted stock returns versus average realized stock returns, the *q*-theory model, matching expected returns and variances simultaneously, time-invariant tax rates. Figures D12*a*, D12*c*, and D12*e* report the volatility plots for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively. Figures D12*b*, D12*d*, and D12*f* report the expected return plots for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively.

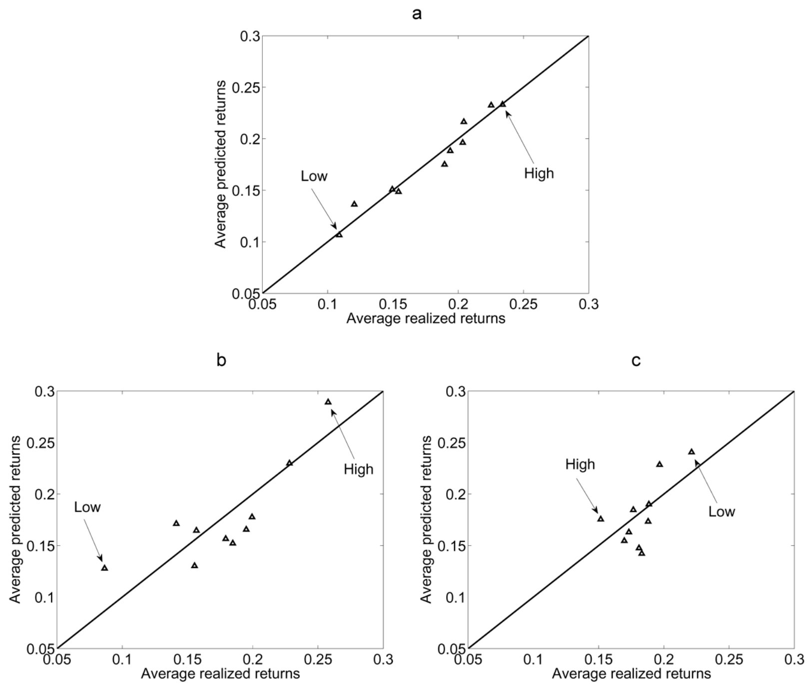

Fig. D13.— Average predicted stock returns versus average realized stock returns, the *q*-theory model, matching only expected stock returns, portfolio-specific tax rates. Figures D13*a*, D13*b*, and D13*c* report the results for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively. High denotes the high decile and low denotes the low decile.

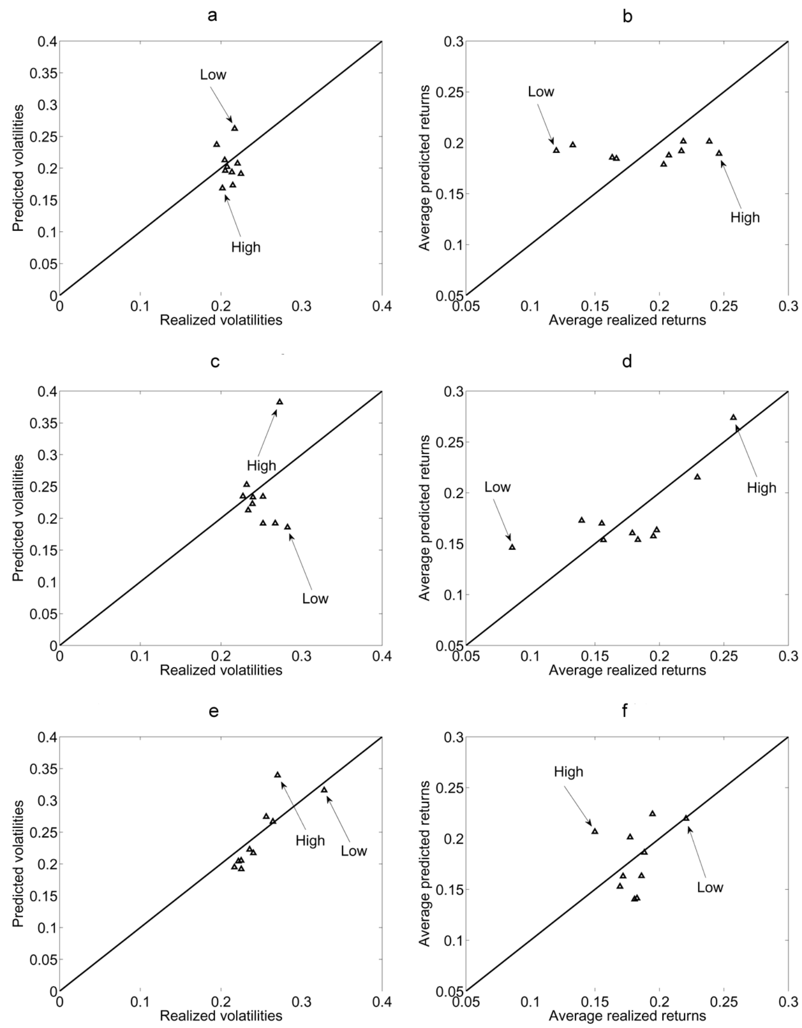

Fig. D14.— Predicted stock return volatilities versus realized stock return volatilities, average predicted stock returns versus average realized stock returns, the *q*-theory model, matching expected returns and variances simultaneously, portfolio-specific tax rates. Figures D14*a*, D14*c*, and D14*e* report the volatility plots for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively. Figures D14*b*, D14*d*, and D14*f* report the expected return plots for the 10 SUE portfolios, the 10 B/M portfolios, and the 10 CI portfolios, respectively.