Internet Appendix to “Organization Capital and the Cross-Section of Expected Returns”

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Summary

Here, we include material supplementary to the paper. In Section I, we explore alternative explanations; Section II presents proofs of the main propositions in the paper; Section III describes the details of the numerical solution of the extended model; Section IV presents additional empirical results and robustness tests; and Section V enumerates the contents of the SG&A expense.

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I. Alternative Explanations

A. Organization Capital Exposed to Separate Technology Shock

One alternative explanation for our findings is that organization capital is exposed to a separate productivity shock. For instance, suppose that firm output was given by

$$y_{it} = \theta_{1t}\, e^{u_{it}}\, K_{it} + \theta_{1t}\, \theta_{Ot}\, e^{\varepsilon_{it}}\, O_{it}, \tag{IA.1}$$

where now θ_{1t} and θ_{Ot} are two separate aggregate productivity shocks that are uncorrelated with each other.

Under this alternative, firms with more organization capital to physical capital would have higher θ_O-risk exposure than firms with low organization capital. If this shock was priced such that $\gamma_{\theta O} > 0$, then firms with high organization capital would earn higher risk premia. Furthermore, returns to the portfolio of high- minus low-O/K firms would be positively correlated with innovations in θ_{Ot} and thus would price the cross-section of portfolios sorted on O/K.

However, this alternative model would produce at least two counterfactual predictions. First, note that given equation (IA.1), the marginal product of organization capital is increasing in θ_O, and therefore so is aggregate investment in organization capital i_O. Hence, under this alternative, we would expect to find a negative coefficient of i_{Ot} on R^x_t in our investment regressions in Section III.D.3. By contrast, we estimate the coefficient of i_{Ot} on R^x_t to be positive and statistically significant. Second, payments to the owners of organization capital would increase in θ_O, implying a positive correlation between the change in the growth rate of executive compensation and the stock returns of the OMK portfolio. However, in the data this correlation is negative, as we document in Section III.D.1.

B. Testing the Conditional CAPM

We test the general alternative hypothesis that firms with more organization capital have increased sensitivity to aggregate shocks in states when the conditional equity premium is high. We do so in three steps. In the first step, we estimate conditional market betas for the high minus low organization capital portfolio using weekly data. We use non-overlapping windows of 52 weekly observations to form a time-series of annual market betas. In the second step, we estimate the conditional equity premium by regressing market returns on a set of conditioning variables:

$$R_{mktt} - R_{ft} = a + bX_{t-1} + e_t. \tag{IA.2}$$

Our set of conditioning variables X includes the dividend yield, term spread, risk free rate, and credit spread from Petkova and Zhang (2005) and the *cay* variable of Lettau and Ludvigson (2001). Given the estimates of a and b, we construct the conditional equity premium as $\gamma_t \equiv E_{t-1}[R_{mktt} - R_{ft}] = \hat{a} + \hat{b}X_{t-1}$. In the third step, we examine the correlation between the conditional equity premium γ_t and the market beta of the OMK portfolio, which is equal to the difference in market beta between high- and low-O/K firms $\beta_t^{omk} \equiv \beta_t^5 - \beta_t^1$. If the correlation between γ_t and β_t^{omk} is positive, then high-O/K firms have higher systematic risk than low O/K firms when the conditional equity premium is high, thus potentially justifying the difference in risk premia.

We find no evidence that high-O/K firms are riskier than low-O/K firms at times when the conditional equity premium is high. The correlation between the market beta of the OMK portfolio β_t^{omk} and the conditional equity premium γ_t estimated in equation (IA.2) is negative and ranges from -37.5% to -7.1% depending on the specification. More generally, the correlation between β_t^{omk} and future excess market returns R^e_{mktt+1} is not statistically significant and equal to -8%. Thus, the conditional CAPM performs even worse than the unconditional CAPM, since high-O/K firms have *lower* market betas than low-O/K firms when the conditional equity premium is high.

C. Sorting Firms on Other Accounting Variables

We explore whether sorting firms on other accounting variables, namely, accumulated sales, cost of goods sold, inventories, depreciation, R&D expenses, or advertising expenses, relative to book assets, produces similar results. Except for sales, none of these variables is successful at consistently generating differences in expected returns, CAPM , Fama and French (1993) or Carhart (1997) alphas across the high and low portfolios.

The fact that sorting firms on accumulated sales leads to differences in average returns is consistent with our model, since firm expenditures in organization capital are an increasing function of firm output y. Thus, sorting firms in portfolios according to accumulated sales over assets leads to quantitatively similar results in simulated data, as we show in the supplementary appendix. Sorting firms on the ratio of organization capital to accumulated sales leads to portfolios significant differences in risk premia, once exposure to other factors is accounted for. The high minus low portfolio has a Fama and French (1993) and Carhart (1997) alpha of 6% and 4.3% respectively.

II. Proofs and Derivations

Proof of Proposition 2: Consider the risk-neutral probability measure $\mathcal{Q}$, implicitly defined given our specification for the SDF. Under this measure, the value of organization capital deployed in firm i equals:

$$\begin{aligned} V^O &= E_t^{\mathcal{Q}} \int_t^{\tau} e^{-r\,(s-t)} \theta_s\, O_{i,s}\, e^{\varepsilon_{i,s}}\, ds + E_t^{\mathcal{Q}}[e^{-r(\tau-t)}\, \overline{V}^{O,\tau}] \\ &= \theta_t\, O_{it}\, E_t^{\mathcal{Q}} \int_t^{\tau} e^{-\int_t^s \rho(\varepsilon_{iu},x)\, du} e^{\varepsilon_{i,s}}\, ds + E_t^{\mathcal{Q}}[e^{-r(\tau-t)}\, \overline{V}^{O,\tau}] \end{aligned}$$

where $\rho(\varepsilon, x) = r_f + \gamma_\theta \sigma_\theta - \mu_\theta + \delta_O - i_O(\varepsilon, x)$. The first equality holds by the law of iterated expectations. We guess that the value of organization capital can be written as

$$V^O = \theta_t O_{it} v(\varepsilon_{it}, x_t).$$

At time t, organization capital's outside option is given by the total value of the organization capital in the new firm, where it will operate at the frontier efficiency, less the adjustment cost necessary to retool the old organization capital. This outside option can be written as

$$\theta_t O_{it} v(x_t, x_t) - C_R(\theta_t, O_{it}).$$

Thus, comparing the inside and outside options, we see that organization capital will only be reallocated to a new firm if

$$v(\varepsilon_{it}, x_t) < v(x_t, x_t) - C_R.$$

In the continuation region, the value of organization capital including current cashflow has a drift equal to r_f under $\mathcal{Q}$. Thus, $v(\varepsilon, x)$ is the solution to

$$\begin{aligned} 0 = \max_{i_O} \Big\{ & e^{\varepsilon} - \frac{c_o}{\lambda_o} i_O^{\lambda_o} - (\bar{r} + \delta_O - i_O)\, v(\varepsilon, x) - \kappa_\varepsilon\, \varepsilon\, v_\varepsilon(\varepsilon, x) + \frac{1}{2}\sigma_\varepsilon^2 v_{\varepsilon\varepsilon}(\varepsilon, x) \\ & - \kappa_x\,(x - \overline{x}) v_x(\varepsilon, x) + \frac{1}{2}\sigma_x^2\, v_{xx}(\varepsilon, x) \Big\}, \qquad \text{if} \quad \varepsilon \geq \varepsilon^*(x). \end{aligned}$$

Because $v(\varepsilon_{it}, x_t)$ is monotonically increasing in ε, continuation will be efficient as long as $\varepsilon_{it} \geq \varepsilon^*(x_t)$. At the boundary $\varepsilon = \varepsilon^*(x)$, the value of organization capital inside the firm equals exactly its value in a new firm minus installation costs:

$$v(\varepsilon^*(x), x) = \max[v(x, x) - c_R, 0].$$

The first order conditions from this Hamilton-Jacobi-Bellman equation yield the level of investment in organization capital in the continuation region. Similar arguments about the value of physical capital V^K yield

$$0 = \max_{i_K} \left\{ e^u - \frac{c_k\, c_q}{\lambda_k} i_K^{\lambda_K} - (\bar{r} + \delta_K - i_K)\, q(u) - \kappa_u\, u\, q'(u) + \frac{1}{2}\,\sigma_u^2\, q''(u) \right\},$$

and the first order condition for investment determines the optimal level of i_K. ■

Proof of Lemma 1: Lack of commitment on both sides implies that $W_t = \overline{V}^O = \theta_t\, O_{it}\, \overline{v}(x_t)$ must always hold. An application of Ito's Lemma implies that organization capital's outside option for $t < \tau$ evolves according to

$$\begin{aligned} d\overline{V}^O \;\; = \;\; & (\mu_\theta + i_O(\varepsilon_{it}, x_t) - \delta_O)\overline{V}^O\, dt + \sigma_\theta\, \overline{V}^O\, dZ_t - \kappa_x\, x_t\, \overline{V}^O\, \frac{\overline{v}_x}{\overline{v}}\, dt + \\ & + \overline{V}^O \frac{\overline{v}_x}{\overline{v}} \sigma_x\, dZ_t^x + \frac{1}{2}\sigma_x^2 \frac{\overline{v}_{xx}}{\overline{v}}\, \overline{V}^O\, dt. \end{aligned}$$

In the event separation or restructuring occurs, organization capital has exercised its option to leave. At this point, labor can extract no more rents from the old firm and thus receives no more payments. The martingale representation theorem and our specification for the SDF imply that under $\mathcal{Q}$, and $t < \tau$, the present value of payments to key talent W_t can be represented as

$$dW_t = (r\,W_t - w_t)\,dt + b_x\,d\tilde{Z}_t^x + b_i\,dZ_t^i + b_\theta\,d\tilde{Z}_t.$$

Switching to the physical measure $\mathcal{P}$, it follows that

$$dW_t = (r\,W_t - w_t)\,dt + b_x\,(dZ_t^x + \gamma_x\,dt) + b_i\,dZ_t^i + b_\theta\,(dZ_t^\theta + \gamma_\theta\,dt).$$

Shareholders will choose a flow payment $w_t\,dt$ and sensitivities b_x, b_i, and b_θ to compensate organization capital to make sure that $W_t = \overline{V}^O$ holds in every state of the world. This boils down to ensuring that $d\,W_t = d\,\overline{V}^O$ for all t and realizations of the Brownian shocks $d\,Z_t^\theta$, $d\,Z_t^x$, and $d\,Z_t^i$. Matching coefficients yields

$$\begin{aligned} b_\theta &= \sigma_\theta\,W_t \\ b_i &= 0 \\ b_x &= \sigma_x\,\frac{\overline{v}_x}{\overline{v}}\,\overline{V}^O \\ r\,W_t - w_t + b_x\,\gamma_x + b_\theta\gamma_\theta &= (\mu_\theta + i_O(\varepsilon_{it}, x_t) - \delta)\,\overline{V}^O - \kappa_x\,x_t\,\frac{\overline{v}_x}{\overline{v}}\,\overline{V}^O + \frac{1}{2}\sigma_x^2\,\frac{\overline{v}_{xx}}{\overline{v}}\,\overline{V}^O. \end{aligned}$$

Finally, combining these four equations gives Lemma 1. ■

III. Numerical procedure

We solve the Hamilton-Jacobi-Bellman equation characterizing the solution using standard techniques. In the continuation region, the function $v(\varepsilon, x)$ satisfies the equation

$$0 = \max_i \left[\exp(\varepsilon) - c_o\lambda^{-1}i^\lambda - (r + \delta - \mu_Q - i)\,v - \kappa_\varepsilon\,\varepsilon\,v_\varepsilon + \frac{1}{2}\sigma_\varepsilon^2 v_{\varepsilon\varepsilon} - \kappa_x\,(x - \overline{x})v_x + \frac{1}{2}\sigma_x^2\,v_{xx}\right].$$

Solving for the optimal investment policy yields the PDE

$$0 = \exp(\varepsilon) - c_o\lambda^{-1}i^\lambda - (r + \delta - \mu_Q - i)\,v - \kappa_\varepsilon\,\varepsilon\,v_\varepsilon + \frac{1}{2}\sigma_\varepsilon^2 v_{\varepsilon\varepsilon} - \kappa_x\,(x - \overline{x})v_x + \frac{1}{2}\sigma_x^2\,v_{xx},$$

where

$$i = \left(\frac{v}{c_0}\right)^{\frac{1}{\lambda - 1}}.$$

The continuation region is defined by $\varepsilon_{i,t} \geq \varepsilon^*(x_t)$, where $\varepsilon^*(x)$ solves

$$v(\varepsilon^*(x), x) = v(x, x) - c \equiv \overline{v}(x).$$

We discretize the state space, creating a 100×100 point grid for (ε, x) and v with $h_\varepsilon = \Delta\varepsilon, h_x = \Delta\, x$. The following approximations can then be used:

$$
\begin{aligned}
v_\varepsilon(\varepsilon_n, x_m) &\approx \frac{v_{n+1,m} - v_{n-1,m}}{2h_\varepsilon} \\
v_{\varepsilon\varepsilon}(\varepsilon_n, x_m) &\approx \frac{v_{n+1,m} + v_{n-1,m} - v_{n,m}}{h^2} \\
v_x(\varepsilon_n, x_m) &\approx \frac{v_{n,m+1} - v_{n,m-1}}{2h_x} \\
v_{xx}(\varepsilon_n, x_m) &\approx \frac{v_{n,m+1} + v_{n,m-1} - v_{n,m}}{h^2}.
\end{aligned}
$$

We next approximate the PDE as

$$
v_{n,m} = p^d_{n,m} v_{n-1,m} + p^u_{n,m} v_{n+1,m} + q^d_{n,m} v_{n,m-1} + q^u_{n,m} v_{n,m+1} + \left(\exp(\varepsilon_n) - c_o\, \lambda^{-1} i^\lambda_{n,m}\right) \Delta t_{n,m},
$$

where

$$
\begin{aligned}
p^d_{n,m} &= \frac{\kappa_\varepsilon h_\varepsilon\, e_n + {\sigma_\varepsilon}^2}{2{h_\varepsilon}^2}\, \Delta t_{n,m} \\
p^u_{n,m} &= -\frac{\kappa_\varepsilon h_\varepsilon\, e_n - {\sigma_\varepsilon}^2}{2{h_\varepsilon}^2}\, \Delta t_{n,m} \\
q^d_{n,m} &= \frac{\kappa_x h_x (x - \overline{x}) + {\sigma_x}^2}{2{h_x}^2} \\
q^u_{n,m} &= -\frac{\kappa_x h_x (x - \overline{x}) - {\sigma_x}^2}{2{h_x}^2} \\
\Delta t_{n,m} &= \frac{{h_\varepsilon}^2 {h_x}^2}{{\sigma_\varepsilon}^2 {h_x}^2 + {\sigma_x}^2 {h_\varepsilon}^2 + (r + \delta - \mu_Q - i_{n,m})\, {h_\varepsilon}^2 {h_x}^2}.
\end{aligned}
$$

Note that care must be taken when choosing (h_ε, h_x) to ensure that the fictitious probabilities $(p,\, q)$ are nonnegative at all points in the grid. Alternative differencing schemes that produce positive probabilities can also be used. Using an initial guess for v, say v^j, we compute the optimal policy and then recursively iterate on v and the policy until convergence:

$$
\begin{aligned}
i^j_{n,m} &= \left(\frac{v^j_{n,m}}{c_o}\right)^{\frac{1}{\lambda-1}} \\
\Delta t^j_{n,m} &= \frac{{h_\varepsilon}^2 {h_x}^2}{{\sigma_\varepsilon}^2 {h_x}^2 + {\sigma_x}^2 {h_\varepsilon}^2 + (r + \delta - \mu_Q - i^j_{n,m})\, {h_\varepsilon}^2 {h_x}^2} \\
v^{j+1}_{n,m} &= \max \Big[v^j(\varepsilon = x_m, x_m) - c, \quad p^d_{n,m} v^j_{n-1,m} + p^u_{n,m} v^j_{n+1,m} + q^d_{n,m} v^j_{n,m-1} + q^u_{n,m} v^j_{n,m+1} \\
&\qquad + (\exp(\varepsilon_n) - c_o\, \lambda^{-1} {i^j_{n,m}}^\lambda) \Delta t^j_{n,m} \Big]
\end{aligned}
$$

We impose reflecting barriers on (ε, x) at the boundaries of the grid, implying $v_{0,m} = v_{1,m}$, $v_{N,m} = v_{N-1,m}$, $v_{n,0} = v_{n,1}$, and $v_{n,M} = v_{n,M-1}$.

IV. Additional Empirical Results

Table IA.I
Firm Characteristics and Organization Capital: Five Portfolios Sorted on O/K (unconditional sort)

This table compares characteristics of the five portfolios sorted on organization capital to book assets unconditionally rather than within industries. See notes to Table III for more details.

Data					
Portfolio	Lo	2	3	4	Hi
Organization capital to book assets	0.20	0.57	1.01	1.57	2.86
Market capitalization (log)	5.02	4.70	4.38	4.00	3.28
Tobin's Q	1.04	1.10	1.17	1.23	1.32
Tobin's Q (scaled by ppe)	1.51	2.39	3.28	3.55	3.61
Sales to book assets (%)	58.3	96.07	113.08	125.81	150.61
Earnings to book assets (%)	7.71	8.39	8.53	8.19	5.02
Investment to capital (organization, %)	27.69	27.03	25.71	23.55	20.27
Investment to capital (physical, %)	12.52	12.10	11.90	11.70	10.72
Executive compensation to book assets (%)	0.50	0.81	0.88	1.05	1.51
Physical capital to book assets	77.43	54.83	44.01	41.11	41.40
R&D expenditures to book assets	0.56	1.71	3.11	4.48	6.55
Advertising expenditures to book assets	0.76	1.31	1.62	2.23	4.07
Debt to book assets	31.39	24.55	20.29	16.69	13.53
Capital to labor (log)	3.66	3.28	3.01	2.83	2.56
Firm Solow Residual	-11.36	-1.21	2.18	4.13	6.24
Firm age (CRSP)	8.03	8.43	9.36	9.57	9.03
Firm age (from IPO)	16.02	13.70	13.21	16.80	12.81

Table IA.II
Asset Pricing: Five Portfolios Sorted on O/K (unconditional sort)

This table shows asset pricing tests for five portfolios sorted on organization capital to book assets unconditionally rather than within industries. See notes to Tables IV and V for more details.

Sort	1	2	3	4	5	5m1
			Panel A. Portfolio moments			
$E[R] - r_f$ (%)	3.76	6.20	5.77	4.64	7.64	3.88
	(1.36)	(2.27)	(2.05)	(1.83)	(2.86)	(1.75)
σ (%)	17.13	16.99	17.47	15.70	16.62	13.74
			Panel B. CAPM			
β_{mkt}	0.99	1.00	1.04	0.89	0.86	-0.14
	(41.24)	(46.23)	(50.83)	(30.08)	(20.02)	(-2.46)
α(%)	-1.33	1.07	0.43	0.07	3.25	4.58
	(-1.17)	(1.08)	(0.46)	(0.06)	(2.07)	(2.00)
R^2(%)	84.56	87.14	89.21	80.87	66.77	2.49
			Panel C. Fama-French three-factor model			
β_{mkt}	1.05	1.01	1.01	0.90	0.87	-0.18
	(44.25)	(43.36)	(41.62)	(32.62)	(23.08)	(-3.50)
β_{smb}	-0.08	-0.09	0.02	-0.11	-0.22	-0.13
	(-2.73)	(-2.90)	(0.58)	(-3.14)	(-3.87)	(-1.86)
β_{hml}	0.14	-0.01	-0.08	-0.04	-0.10	-0.24
	(3.44)	(-0.27)	(-2.29)	(-0.74)	(-1.35)	(-2.52)
α(%)	-2.12	1.26	0.93	0.49	4.21	6.32
	(-1.97)	(1.28)	(0.97)	(0.45)	(2.69)	(2.80)
R^2(%)	85.58	87.45	89.45	81.43	68.81	5.80
			Panel D. Carhart four-factor model			
β_{mkt}	1.05	1.01	1.01	0.90	0.87	-0.18
	(43.49)	(41.55)	(39.95)	(32.15)	(21.94)	(-3.35)
β_{smb}	-0.08	-0.09	0.02	-0.11	-0.22	-0.13
	(-2.65)	(-2.95)	(0.53)	(-3.19)	(-3.86)	(-1.88)
β_{hml}	0.15	-0.02	-0.09	-0.05	-0.10	-0.25
	(3.72)	(-0.43)	(-2.49)	(-0.79)	(-1.30)	(-2.59)
β_{mom}	0.02	-0.03	-0.03	-0.02	0.01	-0.01
	(0.77)	(-0.86)	(-1.22)	(-0.45)	(0.18)	(-0.16)
α(%)	-2.40	1.58	1.32	0.70	4.07	6.48
	(-2.19)	(1.55)	(1.30)	(0.62)	(2.38)	(2.72)
R^2(%)	85.62	87.50	89.52	81.46	68.82	5.81

Table IA.III

Asset Pricing: Five Portfolios Sorted on Accumulated Sales to Book Assets

This table shows asset pricing tests for five portfolios sorted on accumulated sales over assets relative to their industry peers. We use a depreciation rate of 15% and rebalance portfolios in June every year. See notes to Table IV.

	Panel A. Data						Panel B. Model					
Portfolio	1	2	3	4	5	5m1	1	2	3	4	5	5m1
	1. Portfolio moments						1. Portfolio moments					
$E[R] - r_f$ (%)	4.30	5.77	7.15	7.93	8.71	4.42	4.40	5.15	5.93	6.82	8.17	3.61
	(1.32)	(1.94)	(2.67)	(3.08)	(3.33)	(1.85)	(2.11)	(2.51)	(2.75)	(2.96)	(3.13)	(2.14)
σ (%)	18.95	17.39	15.60	15.03	15.26	13.98	13.09	12.93	13.49	14.40	16.35	10.92
	2. CAPM						2. CAPM					
$\alpha(\%)$	-2.90	-0.99	1.04	2.07	3.51	6.41	-0.55	0.32	0.93	1.69	2.81	3.36
	(-2.34)	(-1.13)	(1.42)	(2.58)	(2.40)	(2.67)	(-1.41)	(0.64)	(1.45)	(1.88)	(2.07)	(2.04)
β_{mkt}	1.14	1.07	0.96	0.92	0.82	-0.31	0.99	0.97	0.99	1.02	1.06	0.07
	(33.41)	(45.49)	(59.37)	(44.52)	(23.24)	(-4.99)	(32.32)	(24.57)	(20.13)	(14.86)	(10.14)	(0.55)
$R^2(\%)$	87.57	91.54	92.79	92.12	70.59	12.35	96.25	93.64	90.83	84.25	71.42	2.91
	3. Two-factor model						3. Two-factor model					
$\alpha(\%)$	-0.29	0.23	0.90	1.23	0.42	0.71	-0.05	0.00	0.07	0.13	0.13	0.16
	(-0.27)	(0.28)	(1.17)	(1.64)	(0.32)	(0.35)	(-0.18)	(0.00)	(0.15)	(0.29)	(0.33)	(0.31)
β_{mkt}	1.04	1.02	0.97	0.96	0.94	-0.10	1.01	0.96	0.97	0.98	0.99	-0.02
	(39.81)	(46.63)	(53.70)	(54.40)	(28.35)	(-1.90)	(48.47)	(25.41)	(26.90)	(27.90)	(33.71)	(-0.54)
β_{omk}	-0.42	-0.20	0.02	0.14	0.50	0.92	-0.14	0.08	0.23	0.41	0.71	0.86
	(-9.62)	(-5.11)	(0.77)	(5.73)	(7.91)	(10.82)	(-5.73)	(1.78)	(5.15)	(9.13)	(17.16)	(16.81)
$R^2(\%)$	91.28	92.50	92.81	92.74	78.61	44.90	98.26	94.44	95.25	96.02	97.76	91.13

Table IA.IV
Asset Pricing: Five Portfolios Sorted on Accumulated Accounting Variables

This table shows portfolio average excess returns and alphas for five portfolios sorted on accumulated depreciation (Panel A), R&D expenditures (Panel B), and advertising expenses (Panel C) over book assets relative to their industry peers. We use a depreciation rate of 15% in all specifications. The two factor alpha refers to the alpha from the model with the market portfolio and the OMK portfolio as risk factors. See notes to Tables IV and V for more details.

Panel A. Accumulated Depreciation to Assets	1	2	3	4	5	5m1
$E[R] - r_f$ (%)	3.35	5.42	6.13	6.53	5.26	1.91
	(0.99)	(1.95)	(2.46)	(2.64)	(2.13)	(1.04)
CAPM α(%)	-2.97	0.03	1.28	1.74	0.55	3.53
	(-2.42)	(0.04)	(2.05)	(2.45)	(0.72)	(2.12)
FF3 α(%)	-1.65	0.78	0.98	2.10	0.32	1.97
	(-1.64)	(1.08)	(1.64)	(2.78)	(0.42)	(1.43)
FF4 α(%)	-0.67	1.05	0.23	1.81	0.87	1.54
	(-0.65)	(1.53)	(0.37)	(2.42)	(1.11)	(1.10)
Two factor α(%)	-1.37	0.69	0.24	1.05	0.73	2.09
	(-1.19)	(0.93)	(0.42)	(1.57)	(0.92)	(1.29)
Panel B. Accumulated R&D to Assets	1	2	3	4	5	5m1
$E[R] - r_f$ (%)	4.98	5.39	6.45	6.54	6.76	1.78
	(1.90)	(1.88)	(2.31)	(2.30)	(2.44)	(1.08)
CAPM α(%)	0.07	-0.07	1.17	1.25	1.66	1.60
	(0.07)	(-0.08)	(1.17)	(1.19)	(1.46)	(0.98)
FF3 α(%)	-0.14	1.22	2.89	2.41	2.48	2.62
	(-0.15)	(1.39)	(3.18)	(2.20)	(2.08)	(1.63)
FF4 α(%)	-0.11	1.58	2.83	1.74	2.31	2.43
	(-0.12)	(1.64)	(2.85)	(1.71)	(1.87)	(1.46)
Two factor α(%)	0.22	0.60	1.19	0.75	1.59	1.37
	(0.22)	(0.64)	(1.17)	(0.68)	(1.41)	(0.81)
Panel C. Accumulated Advertising to Assets	1	2	3	4	5	5m1
$E[R] - r_f$ (%)	5.19	5.77	5.47	6.24	6.98	1.79
	(1.77)	(1.98)	(1.94)	(2.33)	(2.46)	(1.18)
CAPM α(%)	-0.31	0.24	0.27	1.23	1.74	2.05
	(-0.27)	(0.26)	(0.23)	(1.19)	(1.55)	(1.36)
FF3 α(%)	0.65	1.32	1.12	1.58	2.68	2.03
	(0.59)	(1.48)	(0.96)	(1.52)	(2.40)	(1.30)
FF4 α(%)	1.33	1.42	1.95	2.08	2.92	1.59
	(1.15)	(1.56)	(1.59)	(1.92)	(2.60)	(1.03)
Two factor α(%)	0.76	0.82	0.57	1.02	1.60	0.84
	(0.69)	(0.86)	(0.47)	(0.96)	(1.43)	(0.56)

Table IA.V
Asset Pricing: Five Portfolios Sorted on Accumulated Accounting Variables, continued

This table shows portfolio average excess returns and alphas for five portfolios sorted on costs of goods sold (Panel A), and inventories (Panel B) over book assets relative to their industry peers. We use a depreciation rate of 15% in all specifications. The two factor alpha refers to the alpha from the model with the market portfolio and the OMK portfolio as risk factors. See notes to Tables IV and V for more details.

Panel A. Accumulated COGS to Assets	1	2	3	4	5	5m1
$E[R] - r_f$ (%)	3.74	5.14	5.86	6.28	7.92	4.17
	(1.29)	(1.99)	(2.22)	(2.46)	(3.14)	(2.08)
CAPM α(%)	-1.74	0.13	0.72	1.34	3.49	5.23
	(-1.67)	(0.18)	(1.15)	(1.85)	(2.79)	(2.60)
FF3 α(%)	0.36	0.23	0.58	0.92	2.39	2.03
	(0.38)	(0.31)	(0.91)	(1.29)	(1.86)	(1.06)
FF4 α(%)	0.91	0.70	0.66	0.66	1.41	0.50
	(1.01)	(0.83)	(1.02)	(0.89)	(1.13)	(0.27)
Two factor α(%)	-0.06	0.02	0.87	1.04	1.07	1.12
	(-0.06)	(0.03)	(1.39)	(1.44)	(0.93)	(0.63)

Panel B. Accumulated Inventories to Assets	1	2	3	4	5	5m1
$E[R] - r_f$ (%)	4.56	5.27	5.37	6.96	7.71	3.14
	(1.58)	(1.99)	(2.22)	(2.80)	(3.05)	(1.61)
CAPM α(%)	-0.90	0.17	0.72	2.22	3.25	4.15
	(-0.90)	(0.22)	(0.98)	(2.76)	(2.61)	(2.12)
FF3 α(%)	0.47	0.35	0.51	1.77	1.52	1.05
	(0.50)	(0.48)	(0.72)	(2.26)	(1.19)	(0.56)
FF4 α(%)	1.40	0.62	0.50	1.44	0.80	-0.60
	(1.47)	(0.77)	(0.67)	(1.88)	(0.64)	(-0.33)
Two factor α(%)	1.17	0.20	0.17	1.17	0.58	-0.58
	(1.36)	(0.26)	(0.23)	(1.56)	(0.54)	(-0.36)

Table IA.VI
Asset Pricing: Performance of Alternative Two-factor Models in Pricing the O/K Cross-section

This table shows asset pricing tests for five portfolios sorted on organization capital over assets relative to their industry peers. We report the alphas of a regression of excess portfolio returns on the market portfolio plus returns to a high-minus-low portfolio of accumulated sales; costs of goods sold; inventories; depreciation; R&D expenses; and advertising. See Tables IV and V for more details.

O/K Sort	1	2	3	4	5	5m1
MKT + 5m1 Sales $\alpha(\%)$	-0.79	-0.25	1.15	0.88	2.57	3.36
	(-1.05)	(-0.30)	(1.54)	(1.29)	(2.75)	(2.75)
MKT + 5m1 Cogs $\alpha(\%)$	-1.08	-0.26	1.33	1.21	2.77	3.85
	(-1.38)	(-0.32)	(1.80)	(1.67)	(2.85)	(2.91)
MKT + 5m1 Inventories $\alpha(\%)$	-0.99	-0.43	1.23	1.26	2.92	3.91
	(-1.30)	(-0.53)	(1.66)	(1.77)	(3.26)	(3.26)
MKT + 5m1 Depreciation $\alpha(\%)$	-1.33	-0.65	1.10	1.20	3.82	5.15
	(-1.68)	(-0.78)	(1.51)	(1.65)	(3.59)	(3.61)
MKT + 5m1 R&D $\alpha(\%)$	-1.60	-1.47	1.03	1.76	4.13	5.73
	(-1.96)	(-1.74)	(1.46)	(2.32)	(4.07)	(4.06)
MKT + 5m1 Advertising $\alpha(\%)$	-1.49	-1.21	1.17	1.70	3.92	5.41
	(-1.84)	(-1.36)	(1.61)	(2.21)	(3.82)	(3.83)

Table IA.VII
The Conditional CAPM and Organization Capital Portfolios

This table presents tests of the conditional CAPM. Panel A presents results from predictive regressions using annual data of excess market returns $R_{mktt} - R_{ft}$ on lagged values of the term premium $term_{t-1}$, dividend yield dp_{t-1}, risk-free rate r_{ft-1}, default spread def_{t-1} and the consumption-to-wealth ratio cay_{t-1}. The first four variables are from Petkova and Zhang (2005) and cay is from Lettau and Ludvigson (2001). Panel B shows correlations of the estimated conditional equity premium $\hat{\gamma}_t \equiv E_t[R_{mktt+1} - R_{ft+1}]$ with the beta of the OMK portfolio with the market $\beta_t^{omk} \equiv \beta_t^5 - \beta_t^1$. We compute betas using non-overlapping window of 1 year using weekly data. We include t-statistics in parenthesis are computed using the Newey-West estimator allowing for 1 lag of serial correlation in returns.

A: Estimating the conditional market premium							B: $corr(\hat{\gamma}_t, \beta_t^5 - \beta_t^1)$
$R_{mktt} - R_{ft}$	$term_{t-1}$	dp_{t-1}	r_{ft-1}	def_{t-1}	cay_{t-1}	R^2	
I	3.185	3.048	0.342	-2.712		7.0%	- 7.1%
	(1.41)	(1.62)	(0.03)	(-0.74)			(-0.45)
II					5.007	16.4%	- 37.5%
					(3.26)		(-2.66)
III	-3.035	4.294	-40.80	14.74	5.023	32.0%	-11.4%
	(-1.25)	(1.94)	(-2.73)	(1.90)	(3.26)		(-0.74)

Table IA.VIII
Asset pricing: Five Portfolios Sorted on O/K
(excluding advertising expenses)

This table shows asset pricing tests for five portfolios sorted on organization capital over assets relative to their industry peers, where we exclude advertising expenses from the computation of organization capital. Specifically, we compute investment in organization capital by subtracting advertising expenses (xad) from SGA (xsga). We restrict the sample to firms that report advertising expenses separately. See notes to Tables IV and V for more details.

Sort	1	2	3	4	5	5m1
			Panel A. Portfolio moments			
$E[R] - r_f$ (%)	4.42	4.88	7.14	7.61	8.95	4.52
	(1.42)	(1.63)	(2.30)	(2.65)	(3.20)	(2.69)
σ (%)	17.82	17.03	17.74	16.41	15.98	9.60
			Panel B. CAPM			
β_{mkt}	1.10	1.04	1.06	1.00	0.92	-0.17
	(51.13)	(40.26)	(36.29)	(45.00)	(31.29)	(-4.42)
α(%)	-1.60	-0.86	1.31	2.13	3.87	5.47
	(-1.68)	(-0.89)	(1.03)	(2.08)	(3.03)	(3.48)
R^2(%)	90.14	89.46	85.29	87.93	79.57	7.72
			Panel C. Fama-French three-factor model			
β_{mkt}	1.05	1.02	0.99	0.96	0.93	-0.12
	(46.68)	(37.29)	(33.92)	(42.86)	(30.28)	(-3.23)
β_{smb}	-0.05	-0.07	-0.06	-0.05	-0.04	0.01
	(-1.46)	(-2.15)	(-1.42)	(-1.28)	(-0.85)	(0.12)
β_{hml}	-0.19	-0.12	-0.27	-0.15	-0.02	0.17
	(-4.35)	(-2.75)	(-5.58)	(-3.68)	(-0.29)	(2.44)
α(%)	-0.35	0.06	3.08	3.14	4.06	4.41
	(-0.37)	(0.07)	(2.59)	(2.92)	(2.98)	(2.70)
R^2(%)	91.00	89.95	87.05	88.57	79.65	10.34
			Panel D. Carhart four-factor model			
β_{mkt}	1.04	1.02	0.98	0.96	0.93	-0.10
	(44.76)	(36.72)	(34.08)	(41.50)	(32.23)	(-2.85)
β_{smb}	-0.04	-0.07	-0.05	-0.05	-0.05	-0.01
	(-1.19)	(-2.07)	(-1.28)	(-1.25)	(-1.04)	(-0.26)
β_{hml}	-0.21	-0.13	-0.28	-0.15	0.00	0.21
	(-5.22)	(-2.74)	(-6.01)	(-3.86)	(0.05)	(3.22)
β_{mom}	-0.10	-0.01	-0.07	-0.01	0.07	0.17
	(-3.97)	(-0.36)	(-2.26)	(-0.36)	(1.79)	(3.48)
α(%)	0.87	0.22	3.88	3.26	3.16	2.78
	(0.93)	(0.19)	(3.26)	(2.96)	(2.37)	(1.74)
R^2(%)	91.63	89.96	87.32	88.58	80.08	16.96

Table IA.IX
Asset pricing: Five portfolios sorted on O/K
(PPE as measure of physical capital)

This table shows asset pricing tests for five portfolios sorted on organization capital over property, plant and equipment (ppegt) relative to their industry peers. See notes to Tables IV and V for more details.

Sort	1	2	3	4	5	5m1
			Panel A. Portfolio moments			
$E[R] - r_f$ (%)	4.01	5.84	5.21	5.88	8.76	4.75
	(1.50)	(2.25)	(1.95)	(2.18)	(3.26)	(2.61)
σ (%)	16.56	16.15	16.56	16.78	16.66	11.33
			Panel B. CAPM			
β_{mkt}	0.99	0.95	1.00	0.98	0.90	-0.09
	(52.11)	(38.67)	(50.94)	(44.96)	(29.45)	(-2.26)
$\alpha(\%)$	-1.06	0.96	0.07	0.85	4.16	5.22
	(-1.22)	(1.04)	(0.09)	(0.82)	(3.10)	(2.99)
$R^2(\%)$	89.43	87.21	92.30	86.07	72.79	1.61
			Panel C. Fama-French three-factor model			
β_{mkt}	1.02	0.97	1.00	0.98	0.88	-0.14
	(54.02)	(41.39)	(58.82)	(43.37)	(24.96)	(-3.26)
β_{smb}	-0.11	-0.11	-0.07	-0.04	-0.02	0.08
	(-3.61)	(-4.10)	(-3.30)	(-0.99)	(-0.54)	(1.32)
β_{hml}	0.05	-0.02	-0.05	-0.05	-0.07	-0.12
	(1.31)	(-0.46)	(-1.61)	(-1.06)	(-1.12)	(-1.50)
$\alpha(\%)$	-1.23	1.25	0.49	1.20	4.63	5.86
	(-1.42)	(1.39)	(0.68)	(1.08)	(3.25)	(3.20)
$R^2(\%)$	90.09	87.72	92.56	86.17	72.95	3.53
			Panel D. Carhart four-factor model			
β_{mkt}	1.01	0.97	1.00	0.99	0.91	-0.10
	(53.63)	(39.76)	(54.90)	(44.41)	(26.86)	(-2.49)
β_{smb}	-0.11	-0.11	-0.07	-0.03	-0.02	0.09
	(-3.98)	(-4.01)	(-3.35)	(-1.03)	(-0.43)	(1.56)
β_{hml}	0.02	-0.02	-0.06	-0.02	-0.03	-0.05
	(0.61)	(-0.39)	(-1.79)	(-0.61)	(-0.55)	(-0.75)
β_{mom}	-0.09	0.01	-0.02	0.08	0.13	0.23
	(-3.89)	(0.27)	(-0.94)	(2.77)	(3.97)	(4.97)
$\alpha(\%)$	-0.03	1.13	0.79	0.15	2.93	2.97
	(-0.04)	(1.12)	(0.95)	(0.13)	(2.13)	(1.86)
$R^2(\%)$	90.74	87.73	92.61	86.67	74.25	11.72

Table IA.X
Sensitivity to the depreciation rate

This table shows differences in expected returns and alphas for the long high organizational capital and short long organizational capital strategy under different assumptions about the depreciation rate. See notes to Tables IV and V for more details.

	$\delta = 0.1$	$\delta = 0.2$	$\delta = 0.3$	$\delta = 0.4$	$\delta = 0.5$
$E(R_{Hi} - R_{Lo})$ (%)	5.01	4.66	3.84	4.07	4.35
	(1.49)	(1.37)	(1.27)	(1.25)	(1.27)
$\alpha_{Hi}^{capm} - \alpha_{Lo}^{capm}$ (%)	6.29	5.50	4.42	4.50	4.69
	(1.45)	(1.37)	(1.26)	(1.24)	(1.26)
$\alpha_{Hi}^{ff3} - \alpha_{Lo}^{ff3}$ (%)	6.44	5.82	5.27	5.60	5.85
	(1.14)	(1.10)	(1.04)	(1.01)	(1.01)

Table IA.XI
OMK portfolio returns and executive compensation, controlling for GDP growth

This table explores the relation between OMK portfolio returns and executive compensation, controlling for GDP growth. See notes to Table VII for more details.

Compensation to key talent ($\Delta\bar{w}_t$)	$-R_t^{omk}$	$-R_{t-1}^{omk}$	Δy_t	Δy_{t-1}	$\Delta\bar{w}_{t-1}$	R^2	$p(F)$ omk=0
Compensation of top 3 officers, average	-0.028	1.067	2.402	1.999	-0.115	0.499	0.001
	(-0.12)	(4.70)	(2.38)	(1.85)	(-0.88)		
			3.049	1.541	-0.145	0.182	
			(2.37)	(1.14)	(-0.87)		
Compensation of top 3 officers, median	0.218	0.417	1.954	1.293	0.021	0.537	0.001
	(1.80)	(3.47)	(3.72)	(2.09)	(0.16)		
			2.139	0.763	0.066	0.322	
			(3.39)	(1.04)	(0.43)		
Compensation of CEO only, average	-0.292	1.185	2.905	1.279	-0.129	0.394	0.048
	(-0.88)	(3.61)	(2.01)	(0.84)	(-0.90)		
			3.657	1.176	-0.205	0.16	
			(2.14)	(0.66)	(-1.21)		
Compensation of CEO only, median	0.044	0.611	1.436	1.425	0.125	0.582	0.001
	(0.36)	(5.10)	(2.69)	(2.40)	(1.05)		
			1.779	1.065	0.121	0.268	
			(2.54)	(1.39)	(0.77)		

Table IA.XII

OMK portfolio returns and reallocation, controlling for lagged GDP growth

This table reports the relation between measures of capital reallocation and the returns of the OMK portfolio, controlling for GDP growth. See notes to Table VIII for more details.

Reallocation X_t	$-R_t^{omk}$	$-R_{t-1}^{omk}$	Δy_t	Δy_{t-1}	X_{t-1}	R^2	$p(R^{omk}=0)$
CEO Turnover	-0.001	0.074	0.797	-0.678	0.803	0.642	0.111
	(-0.04)	(2.49)	(2.54)	(-1.98)	(2.90)		
Capital reallocation rate,	0.008	0.003	0.026	0.025	0.958	0.922	0.002
sale of property, plant and equipment	(2.95)	(1.24)	(2.19)	(2.04)	(20.48)		
Capital reallocation rate,	0.02	0.046	0.209	0.136	0.964	0.902	0.004
incl. mergers and acquisitions	(1.21)	(2.81)	(2.91)	(1.85)	(17.61)		
Number of new initial public offerings,	1.817	1.075	3.223	-12.463	0.003		0.055
(poisson regression)	(1.92)	(0.96)	(0.46)	(-1.77)	(4.80)		
Number of new management buyouts,	0.885	-0.745	3.775	5.401	0.024		0.823
(poisson regression)	(2.23)	(-1.81)	(0.99)	(1.92)	(20.17)		

V. Information on SG&A Expenditures from Company 10-K Filings

We analyze the discussion of SG&A expenses for all firms in the S&P 500. For each of the firms in the S&P500 in 2005, we chose a random year between 2000 and 2005 and searched that firm-year's 10-K for a discussion of the SG&A expense. Of the 500 firms, roughly 350 firms had a specific discussion of the SG&A expense. These firms do not mention a specific dollar breakdown of the SG&A expenses, but enumerate the main types of expenses that led to a change in SG&A expenses from previous years. Out of the 505 companies we considered, 350 had a section in their 10-Ks describing their SG&A expenses. Out of these companies:

- 163 companies reported nonspecific labor costs.
  (Examples: wages; salaries; compensation; labor costs)
- 139 companies reported executive or incentive-based compensation.
  (Examples: performance-based compensation; bonuses; management salaries; commissions to sales force)
- 42 companies reported expenses related to recruiting, employee training, or travel.
  (Examples: recruiting, training; employee relations; travel)
- 114 companies reported costs related to employee benefits.
  (Examples: pension; severance costs; health care; employee benefits)
- 64 companies reported expenses related to technology infrastructure.
  (Examples: information systems; investments to improve processes and systems; infrastructure investments; centralization of merchandising organization)
- 50 companies reported other administrative expenses.
  (Examples: outsourcing; corporate governance; trust and safety programs; expenses of executive and administrative staff, corporate functions, support personnel; human resource; incremental costs related to assessment of internal controls)
- 21 companies reported accounting expenses.
  (Examples: accounting fees; compliance costs; costs to implementing Sarbanes-Oxley)
- 66 companies reported consultant and professional advisory fees.
  (Examples: consulting expenses; professional fees)
- 106 companies reported labor-related expenses for sales and distribution.
  (Examples: investment in the salesforce; expansion of distribution channels; customer service; sales-and-service investments)
- 24 companies reported non-labor-related expenses for sales and distribution.
  (Examples: store remodeling; store closing costs; warehousing; store supplies; store operating expenses)

- 94 companies reported advertising, brand enhancement, and promotion expenses. (Examples: direct advertising; branding; public relations; trade shows; promotion costs)
- 71 companies reported marketing costs, but gave no other information. (Examples: marketing costs)
- 34 companies reported costs related to product or business development. (Examples: product launches; start-up costs; product design and development; business expansion; fund growth opportunities)
- 78 companies reported expenses related to legal costs or settlements. (Examples: lawsuit settlement; litigation expenses)
- 66 companies reported costs related to bad debt expense. (Examples: doubtful accounts; bad debt expense)
- 53 companies reported exchange rate or transaction-related expenses. (Examples: exchange rate fluctuations; credit card fees)
- 85 companies reported costs related to acquisitions or joint business ventures. (Examples: acquisition; joint venture; collaboration agreement)
- 74 companies reported costs related to amortization or depreciation of intangibles. (Examples: amortization; amortization of goodwill; depreciation)
- 82 companies reported costs related to rent or insurance. (Examples: rent; insurance; occupancy costs)
- 86 companies reported costs related to restructuring or reorganization. (Examples: restructuring charges; integration costs; cost savings initiatives; integration; process improvement)
- 14 companies reported related tax-related costs. (Examples: non-income taxes; payroll taxes)
- 36 companies reported non-recurring or other expenses. (Examples: catastrophe losses; impairment; cost of materials and supplies; fuel)
- 4 companies reported expenses for investor communication.
- 10 companies reported charity contributions.

Out of the 155 that did not have any information, 27 did not report SG&A expenses at all. Out of the remaining 128 companies, 56 were financial firms.

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