

$$R_{i,t} = \alpha_i + \beta_{i,M}R_{M,t} + \beta_{i,HML}R_{HML,t} + \beta_{i,SMB}R_{SMB,t} + \varepsilon_{i,t}, \forall i, \quad (9)$$

and

$$R_{i,t} = \gamma_0 + \gamma_M \hat{\beta}_{i,M} + \gamma_{HML} \hat{\beta}_{i,HML} + \gamma_{SMB} \hat{\beta}_{i,SMB} + e_{i,t}, \forall t, \quad (10)$$

### Loadings on the Fama–French Factors from Time-Series Regressions

This table reports loadings on the excess market return,  $R_M$ , and the Fama–French factors  $R_{HML}$  and  $R_{SMB}$  computed in time-series regressions for 25 portfolios sorted by size and book-to-market. The corresponding  $t$ -statistics are also reported and are corrected for autocorrelation and heteroskedasticity using the Newey–West estimator with five lags. The sample period is from July 1963 to December 2001. The intercepts are in percentage form. The last column reports  $F$ -statistics and their corresponding  $p$ -values from an SUR system, testing the joint significance of the corresponding loadings. The  $p$ -values are in percentage form.  $R^2$ s from each time-series regression are reported in percentage form.

Regression: $R_{i,t} = \alpha_i + \beta_{i,M}R_{M,t} + \beta_{i,HML}R_{HML,t} + \beta_{i,SMB}R_{SMB,t} + \varepsilon_{i,t}$											
	Low	2	3	4	High	Low	2	3	4	High	
	$\alpha$					$t_\alpha$					$F$
Small	-0.38	0.01	0.04	0.18	0.12	-3.40	0.18	0.56	2.84	1.91	2.96
2	-0.17	-0.10	0.08	0.08	-0.00	-2.25	-1.45	1.15	1.28	-0.01	0.01
3	-0.07	-0.00	-0.09	0.01	0.00	-1.03	-0.03	-1.26	0.17	0.06	
4	0.16	0.21	-0.08	0.04	-0.05	1.67	-2.27	-0.99	0.61	-0.54	
Large	0.21	-0.04	-0.02	-0.09	-0.21	3.25	-0.53	-0.27	-1.29	-2.36	
	$\beta_M$					$t_{\beta_M}$					$F$
Small	1.04	0.96	0.93	0.92	0.98	44.38	39.40	50.88	46.60	43.39	>100
2	1.11	1.03	1.00	0.99	1.08	48.84	45.42	46.47	60.69	52.11	<0.01
3	1.09	1.07	1.03	1.01	1.10	52.59	38.53	32.93	52.70	38.97	
4	1.05	1.11	1.08	1.03	1.17	46.03	36.33	36.86	41.15	36.74	
Large	0.96	1.04	0.99	1.01	1.04	45.08	49.22	36.71	46.18	31.59	
	$\beta_{HML}$					$t_{\beta_{HML}}$					$F$
Small	-0.31	0.09	0.31	0.47	0.69	-5.86	1.79	9.62	14.97	17.10	>100
2	-0.38	0.18	0.43	0.59	0.76	-8.52	2.96	7.36	13.97	23.28	<0.01
3	-0.43	0.22	0.52	0.67	0.82	-14.90	3.10	7.39	10.58	15.94	
4	-0.45	0.26	0.51	0.61	0.83	-10.55	3.42	7.43	11.92	16.07	
Large	-0.38	0.14	0.27	0.64	0.85	-10.47	2.58	5.65	11.82	20.56	
	$\beta_{SMB}$					$t_{\beta_{SMB}}$					$F$
Small	1.41	1.33	1.12	1.04	1.09	36.39	24.68	36.50	24.34	25.40	>100
2	1.00	0.89	0.75	0.70	0.82	27.61	18.51	15.90	25.31	25.68	<0.01
3	0.72	0.51	0.44	0.38	0.53	24.97	7.68	6.81	8.28	8.87	
4	0.37	0.20	0.16	0.20	0.26	9.26	3.42	2.64	6.70	4.22	
Large	-0.26	-0.24	-0.24	-0.22	-0.08	-9.25	-6.92	-6.12	-6.81	-2.11	
	$R^2$										
						92.61	94.32	94.89	94.51	94.58	
						95.16	93.99	93.56	93.85	94.62	
						94.88	90.22	89.49	89.69	90.31	
						93.52	88.31	87.65	88.41	85.77	
						93.35	89.79	84.32	87.39	80.60	

**Table V**  
**Cross-Sectional Regressions with the Fama–French Factor Loadings  
and Loadings on Innovations to State Variables**

This table presents Fama–MacBeth cross-sectional regressions using the excess returns on 25 portfolios sorted by book-to-market and size. The full-sample factor loadings, which are the independent variables in the regressions, are computed in one multiple time-series regression. The coefficients are expressed as percentage per month. Panel A presents results for the Fama–French three-factor model. Panel B presents results for the model including the excess market return,  $R_M$ , and innovations in the dividend yield, term spread, default spread, and one-month T-bill yield. The Adjusted  $R^2$  follows Jagannathan and Wang (1996) and is reported in percentage form. The first set of  $t$ -statistics, indicated by FM  $t$ -stat, stands for the Fama–MacBeth estimate. The second set, indicated by SH  $t$ -stat, adjusts for errors-in-variables and follows Shanken (1992). The last column reports  $F$ -statistics and their corresponding  $p$ -values (in percentage form) for the test that the pricing errors in the model are jointly zero. Each panel examines the sample period from July 1963 to December 2001.

Panel A: The Fama–French Three-Factor Model						
	$\gamma_0$	$\gamma_M$	$\gamma_{HML}$	$\gamma_{SMB}$	Adj. $R^2$	$F$
Estimate	1.15	−0.65	0.44	0.16	71.00	2.48
FM $t$ -stat	3.30	−1.60	3.09	1.04		0.03
SH $t$ -stat	3.19	−1.55	3.07	1.00		