Three Essays in Asset pricing and Portfolio Choice

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2.A Appendix: Additional Results and Robustness

This appendix presents additional results and robustness checks. In Section 2.A.1 we first test whether adding other variables to our vector autoregressive (VAR) model affects the main results. Then, Section 2.A.2 investigates the relation between betas and industries. Finally, Section 2.A.3 presents the results if we add momentum as an explanatory variable to our cross-sectional regressions.

2.A.1 Results for an Extended VAR Model

For our baseline results in Section 2.4, we use a three-variable VAR for the equity return decomposition including the excess market return (R^e), the short-term interest rate (SR), and the dividend yield (DY). In this section, we study the effect of including additional state variables in the VAR model. We add three variables that are used in earlier literature for predicting excess market returns: the credit spread (CS), the term yield spread (TY), and the small-stock value spread (VS), see for example Avramov (2002), Cremers (2002), and Campbell and Vuolteenaho (2004). We add these variables to the specification used in Section 2.3 and estimate this extended six-variable VAR model.

We construct the new variables in the following way: CS is the yield difference between Moody's Baa and Aaa-rated corporate bonds, and TY is the yield difference between 10-year and 1-year government bonds. We retrieved the data for these two variables from the Federal Reserve's database (FRED). VS is constructed from the six size and book-to-market portfolios provided on Ken French's web site: "The portfolios, which are constructed at the end of each June, are the intersections of two portfolios formed on size (market equity, ME) and three portfolios formed on the ratio of book equity to market equity (BE/ME). The size breakpoint for year t is the median NYSE market equity at the end of June of year t. BE/ME for June of year t is the book equity for the last fiscal year end in $t-1$ divided by ME for December of $t-1$. The BE/ME breakpoints are the 30th and 70th NYSE percentiles." At the end of June of year t, we construct VS as the difference between the log(BE/ME) of the small high-book-to-market portfolio and the log(BE/ME) of the small low-book-to-market portfolio, where BE is measured at the end of December of year $t-1$. For ME we used values at the end of year $t-1$ plus the cumulative return from December year $t-1$ to June year t. For the remaining months from July to May, the small-stock value spread is constructed by adding the cumulative log return (from the previous June) to the small low-book-to-market portfolio, and by subtracting the cumulative log return on the small high-book-to-market portfolio from the end-of-June small-stock value spread. Our VS is similar to the variable constructed by Campbell and Vuolteenaho (2004). The data for all variables are constructed for the period July 1963 to December 2008.

Table A1 shows the VAR parameter estimates. As in the case of the three-variable

Table A1: Extended VAR Parameter Estimates

This table shows the OLS estimates of the extended six-variable vector autoregressive (VAR) model. The dependent variables are the log excess market return ($R^e_{m,t}$), the short-term interest rate (SR_t), the dividend yield (DY_t), the credit spread (CS_t), the term yield spread (TY_t), and the value spread (VS_t). Standard errors are given in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent level, respectively.

	Intercept	$R^e_{m,t}$	SR_t	DY_t	CS_t	TY_t	VS_t	R^2%
$R^e_{m,t+1}$	0.000	0.086**	-0.193**	0.505***	0.274	0.146	-0.005	3.37
	(0.021)	(0.039)	(0.094)	(0.184)	(0.551)	(0.219)	(0.012)	
SR_{t+1}	0.002	0.007*	1.012***	-0.003	-0.209***	0.037*	-0.001	97.55
	(0.002)	(0.004)	(0.010)	(0.019)	(0.057)	(0.023)	(0.001)	
DY_{t+1}	0.001*	-0.015***	0.007***	0.986***	-0.039***	-0.001	0.000	97.55
	(0.001)	(0.001)	(0.002)	(0.004)	(0.013)	(0.005)	(0.000)	
CS_{t+1}	0.000	-0.005***	-0.001	0.005	0.997***	-0.013**	0.000	94.41
	(0.000)	(0.001)	(0.002)	(0.004)	(0.013)	(0.005)	(0.000)	
TY_{t+1}	-0.002*	-0.002	-0.010*	0.007	0.135***	0.944***	0.001*	93.48
	(0.001)	(0.002)	(0.006)	(0.011)	(0.034)	(0.014)	(0.001)	
VS_{t+1}	0.111***	0.004	-0.132	-0.292	0.881	-0.226	0.932***	88.76
	(0.025)	(0.047)	(0.115)	(0.224)	(0.672)	(0.267)	(0.015)	

VAR, both the short-term interest rate and the dividend yield are highly persistent and have a statistically significant impact on stock returns. None of the new variables have a significantly predictive power for excess returns and R^2 do not improve substantially. The statistical insignificance of the additional state variables in the VAR was the prime reason why they were not used in in Section 2.3. In this appendix, however, we will also present the results of the (partially insignificant) six-variable VAR system for the sake of completeness.

Table A2 shows the variance-covariance of the cash flow and discount rate news components as estimated by the new extended(six-variable) VAR system. The variance-covariance matrix of the new news factors very much resembles the results in Table 2.2.

Table A2: Extended VAR: Variance-Covariance Matrix of CF and DR News

This table shows the variance-covariance matrix of the unexpected market return (u_{mt}) and its two components, cash flow (CF) news and discount rate (DR) news, using the extended six-variable VAR model from Table A1. The VAR model includes the excess market return R_{mt} (above the risk-free rate), the short (3-month) rate SR_t, the S&P500 dividend yield DY_t, the credit spread CS_t, the term yield spread TY_t, and the value spread VS_t.

	u_{mt}	$N_{CF,t}$	$N_{DR,t}$
u_{mt}	0.0020	0.0008	0.0012
$N_{CF,t}$	0.0008	0.0008	0.0000
$N_{DR,t}$	0.0012	0.0000	0.0012
Mean	0.0004	-0.0001	0.0005

We employ the same Fama and MacBeth (1973) regression methodology as in Section 2.2.3 for determining the factor premia. Table A3 shows our baseline results using the new extended VAR model. This is the counterpart to Table 2.3. Model III presents the results for the cash flow and discount rate beta model. We see a higher premium for the discount rate (DR) beta than for the cash flow (CF) beta. This difference is significant. When we add size and book-to-market to our specification (model VII), we obtain similar results. For the four-beta model downside premia again have a higher premium than upside betas. The relative magnitude has changed somewhat compared to results in Table 2.3 and the premium for the downside discount rate (DDR) beta is higher than for the downside cash flow (DCF) beta. This holds especially after controlling for size and book-to-market (model VIII). Overall, the main difference is that we observe a somewhat higher premium for discount rate news in the different models based on the extended six-variable rather than on our original three-variable VAR system.

Table A3: Extended VAR: Baseline Risk Premia Estimates

This table presents the time-series averages and their HAC standard errors (in parentheses) of the Fama-MacBeth premia estimates λ_{jt}, where t denotes the 60-month rolling window, and j denotes the risk factor, being downside (D), upside (U), cash flow (CF), discount rate (DR), downside cash flow (DCF), downside discount rate (DDR), upside cash flow (UCF), and upside discount rate (UDR) risk, respectively, using the extended six-variable VAR for our return decomposition. The sample consists of monthly returns for all listed companies on the NYSE, AMEX, and NASDAQ exchanges from July 1963 to December 2008 (546 months), using the CRSP-Compustat merged database in WDRS. There are 486 sixty-months overlapping estimation windows in the sample. Stocks with one or more missing data points in a specific estimation window are deleted from the cross-sectional regression for that window. The number of stocks in each cross-sectional regression varies from 383 to 3,703. Returns in each window have been winsorized at the 1% level and 99% level. ***, **, and * denote significance at the 1, 5, and 10 percent level, respectively.

	I	II	III	IV	V	VI	VII	VIII
α	0.300***	0.274***	0.323***	0.297***	0.708***	0.676***	0.732***	0.710***
	(0.065)	(0.064)	(0.063)	(0.063)	(0.211)	(0.210)	(0.209)	(0.206)
λ	0.474***				0.518***			
	(0.056)				(0.047)			
λ_D		0.413***				0.381***		
		(0.051)				(0.038)		
λ_U		0.076**				0.152***		
		(0.033)				(0.035)		
λ_{CF}			0.311***				0.375***	
			(0.059)				(0.061)	
λ_{DR}			0.626***				0.683***	
			(0.082)				(0.068)	
λ_{DCF}				0.319***				0.265***
				(0.062)				(0.050)
λ_{DDR}				0.483***				0.501***
				(0.063)				(0.050)
λ_{UCF}				0.061				0.166***
				(0.051)				(0.047)
λ_{UDR}				0.133***				0.193***
				(0.045)				(0.047)
Size					-0.061***	-0.059***	-0.061***	-0.060***
					(0.015)	(0.015)	(0.015)	(0.014)
B/M					0.324***	0.327***	0.324***	0.324***
					(0.026)	(0.026)	(0.026)	(0.025)
R^2	0.072	0.081	0.082	0.099	0.144	0.151	0.152	0.164

Table A4 presents the results of our subsample analysis. This is the counterpart to Table 2.4. Panel A of Table A4 shows the estimation results of our four-beta model over the different decades in our sample. The results over the 1970s and 1980s are similar to results in Panel A of Table 2.4. For the 1990s, we observe a higher premium for the DDR beta while for the 2000s, the DCF beta is no longer significant and we find a positive and significant premium for the DDR beta.

Table A4: Extended VAR: Subsample Analysis

This table presents the premia estimates and their standard errors as in Table A3, but for different subsamples. Panel A shows the results for different decades. In Panel B, we sort all companies for each rolling window based on their market capitalization at the beginning of the period and construct 5 quintiles. In Panel C, we sort all companies based on their book-to-market value at the beginning of each rolling window. Premia are computed for each quintile. ***, **, and * denote significance at the 1, 5, and 10 percent level, respectively.

Panel A: Sample Periods					
	1970s	1980s	1990s	2000s	1963-2008
α	0.075	0.187**	0.234**	0.841***	0.297***
	(0.071)	(0.088)	(0.116)	(0.118)	(0.063)
λ_{DCF}	0.161*	0.911***	0.254***	-0.030	0.319***
	(0.092)	(0.079)	(0.077)	(0.113)	(0.062)
λ_{DDR}	0.463***	0.590***	0.417***	0.284**	0.483***
	(0.148)	(0.085)	(0.076)	(0.111)	(0.063)
λ_{UCF}	0.077	-0.085***	0.302***	0.009	0.061
	(0.158)	(0.028)	(0.060)	(0.053)	(0.051)
λ_{UDR}	-0.207***	0.010	0.232***	0.496***	0.133***
	(0.059)	(0.050)	(0.035)	(0.108)	(0.045)
Panel B: Size					
	Small	2	3	4	Large
α	0.320***	0.181**	0.308***	0.447***	0.489***
	(0.093)	(0.077)	(0.071)	(0.051)	(0.050)
λ_{DCF}	0.509***	0.359***	0.347***	0.043	-0.149*
	(0.046)	(0.063)	(0.072)	(0.084)	(0.080)
λ_{DDR}	0.656***	0.599***	0.424***	0.227***	0.288***
	(0.061)	(0.069)	(0.059)	(0.058)	(0.089)
λ_{UCF}	0.123***	0.193***	0.176***	0.286***	0.214***
	(0.043)	(0.058)	(0.058)	(0.052)	(0.065)
λ_{UDR}	0.161***	0.161***	0.147**	0.174**	0.117*
	(0.028)	(0.057)	(0.069)	(0.068)	(0.069)
Panel C: Book-to-Market (B/M)					
	Low	2	3	4	High
α	-0.130	0.044	0.197***	0.402***	0.483***
	(0.086)	(0.067)	(0.061)	(0.061)	(0.074)
λ_{DCF}	0.296***	0.224***	0.292***	0.320***	0.610***
	(0.080)	(0.079)	(0.074)	(0.065)	(0.061)
λ_{DDR}	0.605***	0.680***	0.521***	0.456***	0.514***
	(0.065)	(0.067)	(0.062)	(0.067)	(0.069)
λ_{UCF}	0.073	0.082	0.110**	0.042	0.098**
	(0.059)	(0.053)	(0.051)	(0.047)	(0.050)
λ_{UDR}	0.168***	0.238***	0.284***	0.230***	0.094***
	(0.053)	(0.060)	(0.052)	(0.045)	(0.032)

Panel B of Table A4 displays the results for the five size quintiles. Again, as in panel B of Table 2.4, we find a clear size effect: the DCF and DDR beta premia are the largest for the smallest stocks and decrease across size quintiles when we move to larger stocks. One difference is that here the DDR beta has a higher premium than the DCF beta,

Table A5: Extended VAR: Current Betas and Future Expected Returns

This table presents the time-series means and corresponding HAC standard errors (in parentheses) of the Fama-MacBeth estimates of the premia for downside cash flow (DCF), downside discount rate (DDR), upside cash flow (UCF), and upside discount rate (UDR) risk, using the extended six-variable VAR for our return decomposition. Model I uses the cross-sectional Fama-MacBeth regressions based on 60-month rolling window estimates of betas and average returns over the same rolling window. Model II uses the same betas, but uses the next month's return following the rolling window as its dependent variable. Model III uses the average of the next 60-month out-of-window returns as the dependent variable. Models IV to VI are similar to I to III, but also include size and book-to-market controls. The data is the same as for Table A3. ***, **, and * denote significance at the 1, 5, and 10 percent level, respectively.

	I	II	III	IV	V	VI
	60m in-sample	1m out-of-sample	60m out-of-sample	60m in-sample	1m out-of-sample	60m out-of-sample
α	0.297***	0.604***	0.698***	0.710***	0.209	1.080***
	(0.063)	(0.210)	(0.058)	(0.206)	(0.573)	(0.196)
λ_{DCF}	0.319***	-0.249	0.321***	0.265***	-0.229	0.220***
	(0.062)	(0.183)	(0.056)	(0.050)	(0.164)	(0.039)
λ_{DDR}	0.483***	0.051	-0.019	0.501***	0.150	0.026
	(0.063)	(0.150)	(0.037)	(0.050)	(0.132)	(0.029)
λ_{UCF}	0.061	0.047	-0.041	0.166***	-0.007	0.031
	(0.051)	(0.145)	(0.038)	(0.047)	(0.130)	(0.033)
λ_{UDR}	0.133***	0.088	-0.015	0.193***	0.075	-0.001
	(0.045)	(0.108)	(0.030)	(0.047)	(0.098)	(0.027)
Size				-0.060***	0.021	-0.046***
				(0.014)	(0.036)	(0.015)
B/M				0.324***	0.177**	0.215***
				(0.025)	(0.085)	(0.020)

which is in line with the results for the complete stock universe.

Our findings for the five subsamples sorted based on book-to-market are presented in Panel C of Table A4. The estimates are very similar to the baseline results in panel C of Table 2.4. One exception is for the high value stocks, where we again find a somewhat higher premium for the DDR beta.

Finally, Table A5 shows the results of the out-of-sample test of our extended four-beta model. This is the counterpart to Table 2.7. We use the same methodology as described in Section 2.4.4. The results in the table show the same pattern as what we found using the three-variable VAR. For one-month out-of-sample returns, the results are very noisy. However, if we use 60-months out-of-sample returns, we obtain the familiar results from 2.4.4: the DCF beta is the only component of the four-beta model that is priced significantly out-of-sample.

2.A.2 Industry-specific Beta Estimates

In this section we study the relation between industries and their respective betas by examining whether different industries load differently on downside, upside, cash flow or discount rate betas. For defining industries we follow Moskowitz and Grinblatt (1999) and Giannikos and Ji (2007) and classify 20 industries based on the first two digits of their SIC code.

We regress (cross-sectionally) betas (downside beta, upside beta, cash flow beta, and discount rate beta) estimated over a specific window of the standard Fama-Macbeth estimation procedure on the industry dummies. We repeat this for all estimation windows and report the time-series average of the estimated dummy coefficients as well as their HAC standard errors. We also include (demeaned) size and book-to-market as regressors to control for possible size and book-to-market effects. In order to ensure that extreme outliers do not drive the results, we winsorize betas in each cross-sectional regression at the 5% and 95% level. In our regressions, we treat the industry category "other" as the benchmark and do not include a separate dummy variable for it.

Table A6 presents the results. The value for the downside beta is 1.14 for the benchmark industry. The coefficients estimated for the remaining industries represent the additional effect of those industries over the benchmark. We observe a clear industry effect. Some industries like Food and Utilities have the lowest level of downside beta and some industries like Machinery and Electrical Equipment have the highest downside betas. We observe almost the same pattern for upside beta, CF beta, and DR beta. This implies that if we correct for regular beta, differences between industries might disappear. Therefore, we perform the regressions also for the additional effect of downside beta, DCF beta, and DDR beta over the regular beta, CF beta, and DR beta, respectively. The results are presented in Table A7. We find that for some industries, like Utilities, the difference of the loading on the additional downside beta is statistically significant, though the differences between industries appear not really economically significant.

Table A6: Industries-specific Betas

This table shows the industry-specific beta estimates. We use all listed companies on the NYSE, AMEX, and NASDAQ exchanges from July 1963 to December 2008 (546 months), employing the CRSP-Compustat merged database in WRDS. We regress betas (downside beta(β_D), upside beta(β_U), CF beta(β_{CF}), and DR beta(β_{DR})), estimated in each window of the Fama-Macbeth estimation procedure on one constant, 19 industry dummies, and demeaned size and book-to-market controls of stocks. For classifying the industries we follow Moskowitz and Grinblatt (1999) and Giannikos and Ji (2007) and define 20 industries based on the first two digits of their SIC code of each stock in the CRSP database in the first month of the respective 60-month window. The constant corresponds to "other industry", while the other 19 dummy variables represent the other 19 industries. The table reports time-series averages and their HAC standard errors of the estimated coefficients λ_{jt}, estimated in each Fama-MacBeth regression, where t denotes the specific 60-month rolling window and j denotes the specific industry. In total, our sample contains 486 sixty-months overlapping estimation windows. Stocks with one or more missing data points in a specific estimation window are deleted from the cross-sectional regression for that window. The number of stocks in each cross-sectional regression varies from 383 to 3,703. Returns in each window have been winsorized at the 1% level and 99% level.

	β_D			β_U			β_{CF}			β_{DR}		
	Coef	HACSE	t-HACSE	Coef	HACSE	t-HACSE	Coef	HACSE	t-HACSE	Coef	HACSE	t-HACSE
Utilities	**-0.57**	0.01	-51.50	**-0.53**	0.01	-39.80	**-0.18**	0.02	-10.90	**-0.37**	0.01	-39.80
Food	**-0.32**	0.02	-16.40	**-0.33**	0.02	-13.70	**-0.13**	0.01	-8.93	**-0.20**	0.01	-20.60
Petroleum	**-0.20**	0.03	-7.74	**-0.26**	0.02	-11.30	**-0.12**	0.01	-10.30	**-0.10**	0.02	-5.12
Financial	**-0.18**	0.02	-7.75	**-0.17**	0.03	-6.87	**-0.07**	0.02	-4.33	**-0.12**	0.01	-10.70
Mining	**-0.14**	0.02	-6.21	**-0.16**	0.03	-6.28	**-0.10**	0.01	-8.43	**-0.06**	0.02	-3.04
Railroads	**-0.14**	0.02	-6.55	**-0.16**	0.02	-6.87	**-0.07**	0.01	-5.35	**-0.07**	0.01	-5.54
Fab. Metals	**-0.12**	0.01	-11.40	**-0.11**	0.01	-8.00	**-0.06**	0.01	-9.51	**-0.05**	0.01	-8.96
Paper	**-0.11**	0.01	-8.72	**-0.12**	0.02	-6.96	**-0.07**	0.01	-8.75	**-0.05**	0.01	-7.59
Apparel	**-0.11**	0.02	-6.52	**-0.12**	0.02	-7.48	**-0.07**	0.01	-8.40	**-0.04**	0.01	-5.27
Dept. Stores	**-0.08**	0.01	-8.10	**-0.08**	0.01	-7.04	**-0.03**	0.00	-8.07	**-0.05**	0.01	-6.54
Construction	**-0.08**	0.01	-6.97	**-0.04**	0.02	-2.64	**-0.03**	0.01	-4.02	**-0.04**	0.01	-5.61
Retail	**-0.07**	0.02	-4.20	**-0.13**	0.02	-7.90	**-0.03**	0.01	-3.71	**-0.06**	0.01	-6.73
Chemical	**-0.04**	0.01	-3.67	**-0.02**	0.01	-1.97	**-0.02**	0.01	-2.83	**-0.01**	0.01	-2.74
Transport Eq	-0.02	0.02	-0.85	-0.03	0.02	-1.39	**-0.02**	0.01	-3.12	0.00	0.01	0.35
Other Transport	0.01	0.02	0.41	-0.01	0.02	-0.58	0.01	0.01	0.74	-0.01	0.01	-1.06
Prim. Metals	**0.03**	0.01	2.70	0.02	0.02	1.13	**0.02**	0.01	3.85	0.01	0.01	0.69
Manufacturing	**0.04**	0.01	4.26	**0.03**	0.01	3.59	**-0.01**	0.00	-2.49	**0.04**	0.01	7.01
Machinery	**0.07**	0.01	12.70	**0.09**	0.01	10.90	**0.01**	0.00	3.37	**0.06**	0.00	16.40
Electrical Eq	**0.18**	0.02	11.90	**0.20**	0.02	10.60	**0.07**	0.01	5.85	**0.12**	0.01	15.50
Other	**1.14**	0.01	84.80	**1.06**	0.02	48.10	**0.40**	0.02	21.80	**0.71**	0.02	33.10
Size	-0.01	0.00	-1.27	**0.03**	0.01	6.17	**0.01**	0.00	5.90	0.00	0.00	-0.39
B/M	**-0.09**	0.01	-10.20	**-0.09**	0.01	-9.47	**-0.03**	0.01	-5.67	**-0.06**	0.01	-9.92

Table A7: Industries and Additional Downside Betas

This table presents the industry-specific beta estimates after controlling for additional effects of downside beta. We use the same data as Table A6. We regress additional downside betas (downside beta minus regular beta ($\beta_D - \beta$), DCF beta minus CF beta ($\beta_{DCF} - \beta_{CF}$), and DDR beta minus DR beta ($\beta_{DDR} - \beta_{DR}$)), estimated in each window of the Fama-Macbeth estimation procedure, on one constant, 19 industry dummies, and demeaned size and book-to-market factors of stocks. The constant corresponds to "other industry", while the other 19 dummy variables represent the other 19 industries. The table reports time-series averages and their HAC standard errors of the estimated coefficients λ_{jt}, estimated in each Fama-MacBeth regression, where t denotes the respective 60-month rolling window and j denotes the specific industry.

	$\beta_D - \beta$			$\beta_{DCF} - \beta_{CF}$			$\beta_{DDR} - \beta_{DR}$		
	Coef	HACSE	t-HACSE	Coef	HACSE	t-HACSE	Coef	HACSE	t-HACSE
Utilities	**-0.015**	0.004	-3.640	**-0.013**	0.006	-2.190	-0.009	0.005	-1.770
Food	0.005	0.005	1.010	**-0.017**	0.004	-4.410	**0.024**	0.004	5.660
Petroleum	**0.028**	0.006	4.760	**0.027**	0.007	3.820	0.000	0.007	-0.022
Financial	**-0.005**	0.003	-2.100	-0.003	0.004	-0.693	0.001	0.004	0.324
Mining	0.007	0.006	1.160	**0.022**	0.007	3.210	-0.012	0.007	-1.770
Railroads	0.006	0.009	0.703	**0.013**	0.005	2.460	-0.008	0.007	-1.060
Fab. Metals	**-0.006**	0.003	-2.260	0.004	0.004	1.190	**-0.009**	0.003	-2.610
Paper	0.009	0.005	1.850	0.000	0.004	-0.012	**0.011**	0.005	2.040
Apparel	0.005	0.004	1.160	**0.011**	0.004	2.630	-0.006	0.004	-1.370
Dept. Stores	-0.002	0.003	-0.558	**0.005**	0.003	2.010	-0.005	0.003	-1.460
Construction	**-0.018**	0.006	-2.790	-0.005	0.004	-1.350	**-0.013**	0.006	-2.380
Retail	**0.024**	0.007	3.620	0.000	0.005	0.057	**0.023**	0.006	4.000
Chemical	-0.005	0.003	-1.700	-0.005	0.003	-1.440	0.002	0.004	0.568
Transport Eq	0.006	0.004	1.350	0.006	0.004	1.590	-0.002	0.006	-0.373
Other Transport	0.009	0.005	1.740	-0.007	0.005	-1.530	**0.017**	0.007	2.320
Prim. Metals	**0.010**	0.004	2.520	-0.002	0.004	-0.502	0.007	0.005	1.410
Manufacturing	0.004	0.002	1.770	**0.008**	0.004	2.010	-0.003	0.003	-0.953
Machinery	**-0.005**	0.002	-2.130	-0.002	0.003	-0.825	-0.003	0.003	-1.050
Electrical Eq	-0.005	0.003	-1.410	**0.014**	0.004	3.500	**-0.017**	0.005	-3.420
Other	**0.033**	0.006	5.160	**0.027**	0.005	5.040	0.007	0.008	0.805
Size	**-0.017**	0.001	-14.600	**-0.012**	0.001	-8.670	**-0.006**	0.001	-6.530
B/M	-0.002	0.002	-1.260	**-0.009**	0.001	-6.670	**0.009**	0.002	4.960

2.A.3 Risk Premia Estimates: Adding Momentum

In this section we add momentum as a regressor to our cross-sectional regression to see whether our findings remain robust. Since we follow the approach of Lettau and Ludvigson (2001) and Ang, Chen, and Xing (2006) in our paper, we estimate betas and average returns in our cross-sectional regressions over the same data window. Therefore, we need to estimate momentum at the beginning of each window of the Fama-Macbeth procedure to act as a pre-determined regressor for the average of the next 60 months' returns. We use two momentum measures for this purpose: the cumulative return over the past 12 months and the cumulative return over the previous 60 months. Both of these are measured over the period preceding the data window for the cross-sectional regressions. Table A8 shows the results. In the first four models, we use the cumulative return over the past 12 months (preceding the data window for the average return computations) as the proxy for momentum; in the second four models we use the cumulative return over the previous 60 months. In all models, we observe a negative significant premium for the momentum factor. More importantly, however, the main results on the prices of the different betas remain robust.

Table A8: Baseline Risk Premia Estimates: Adding Momentum

This table shows the time-series averages and their HAC standard errors (in parentheses) of the Fama-MacBeth premia estimates λ_{jt}, where t denotes the respective 60-month rolling window, and j denotes the risk factor, namely downside (D), upside (U), cash flow (CF), discount rate (DR), downside cash flow (DCF), downside discount rate (DDR), upside cash flow (UCF), and upside discount rate (UDR) risk, respectively. Controls are size, book-to-market (B/M) and momentum (M). The sample consists of monthly returns for all listed companies on the NYSE, AMEX, and NASDAQ exchanges from July 1963 to December 2008 (546 months), using the CRSP-Compustat merged database in WRDS. There are 486 sixty-months overlapping estimation windows in the sample. Stocks with one or more missing data points in a specific estimation window are deleted from the cross-sectional regression for that window. The number of stocks in each cross-sectional regression varies from 383 to 3,703. Returns in each window have been winsorized at the 1% level and 99% level. ***, **, and * denote significance at the 1, 5, and 10 percent level, respectively.

	I	II	III	IV	V	VI	VII	VIII
α	0.715***	0.691***	0.794***	0.783***	0.810***	0.828***	0.908***	0.942***
	(0.208)	(0.208)	(0.207)	(0.202)	(0.200)	(0.200)	(0.200)	(0.195)
λ	0.526***				0.490***			
	(0.046)				(0.044)			
λ_D		0.382***				0.305***		
		(0.038)				(0.040)		
λ_U		0.160***				0.194***		
		(0.037)				(0.037)		
λ_{CF}			0.640***				0.793***	
			(0.076)				(0.096)	
λ_{DR}			0.598***				0.485***	
			(0.075)				(0.077)	
λ_{DCF}				0.485***				0.543***
				(0.054)				(0.068)
λ_{DDR}				0.378***				0.207***
				(0.051)				(0.049)
λ_{UCF}				0.283***				0.419***
				(0.058)				(0.065)
λ_{UDR}				0.171***				0.184***
				(0.053)				(0.056)
Size	-0.058***	-0.056***	-0.063***	-0.062***	-0.041***	-0.042***	-0.049***	-0.051***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.013)	(0.013)	(0.013)	(0.013)
B/M	0.291***	0.294***	0.284***	0.286***	0.183***	0.181***	0.177***	0.176***
	(0.027)	(0.027)	(0.026)	(0.026)	(0.016)	(0.016)	(0.015)	(0.015)
M	-0.001***	-0.001***	-0.001***	-0.001***	-0.002***	-0.002***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R^2	0.144	0.151	0.153	0.167	0.134	0.140	0.144	0.159