ESG controversy as a potential asset-pricing factor

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Highlight

•We construct ESG and ESG controversy risk factors and estimate their covariance risk prices and risk premia.
•Our ESG controversy risk factor has explanatory power for the cross-section of expected returns.
•Investors exposed to ESG controversy risk require a risk premium.
•ESG risk is regarded as idiosyncratic.

Abstract

We examine whether ESG and ESG controversy risks are pricing factors that systemically affect the risk-return relationship. We test their additional explanatory power after controlling for other well-known risk factors. ESG controversy risk factor explains the cross-section of stock market returns. Investors exposed to ESG controversies demand a risk premium whereas ESG risk is regarded as idiosyncratic.

Keywords: Asset pricing; ESG; ESG controversy; Risk factor; Risk premium
JEL Classifications: G11, G12, M14

1. Introduction

Recent literature has explored the relationship between a firm's ESG (Environmental, Social, and

Governance) activities and its performance, as well as the validity of socially responsible investments. Investors start to prefer sustainable mutual funds and ESG becomes their major consideration (Hartzmark and Sussman, 2019). In this vein, discussions on whether ESG can be an asset-pricing factor have recently come into the spotlight both theoretically and empirically (Cornell, 2021). Companies implementing ESG activities can lower the cost of capital which is closely related to lower expected returns (Heinkel, Kraus, and Zechner, 2001). If ESG activities are related to risks regarding corporate operations and practices, investors bearing these risks from disputes with various stakeholders will demand higher returns.

The potential of ESG as a risk factor has been controversial in the financial-economic literature and is still an open question. Recent empirical studies analyze whether ESG is a *priced* risk factor. Husse and Pippo (2021) find the insignificant risk premia of ESG factors after controlling for firm sizes in portfolio construction. Naffa and Fain (2022) observe insignificant ESG alpha, while the environmental portfolio exhibits significant alpha. Becchetti, Ciciretti, and Dalò (2018) argue that domain-specific CSR risk factors partially capture pricing anomalies and that companies with low CSR (corporate social responsibility) scores pay a risk premium.

Motivated by previous studies' mixed views regarding the potential of ESG as a risk factor, we discuss whether ESG and ESG controversies are priced risk factors and reexamine the systematic relationship between ESG (controversies) and stock returns. Especially, this letter contributes to the existing literature by focusing on ESG risk with controversies that refer to problematic behaviors of firms that are exposed by media disclosures (Aouadi and Marsat, 2018). We construct portfolios based on Refinitiv ESG and ESG controversies scores. We use monthly ESG data and extensive test portfolios in the US market over a long period (2002-2020). We also control not only size and value factors but also recently proposed factors such as investment and profitability. We then test pricing errors for the ESG (controversies) long-short portfolios and investigate covariance risk prices for ESG (controversies) factor and their risk premia under Fama-MacBeth regression.

This letter thoroughly explores the potential of ESG and ESG controversy as priced risk factors. Though there have been attempts at theoretical discussions and empirical analyses on whether ESG or CSR can be a priced risk factor, to the best of our knowledge, there have been no studies that thoroughly examine whether ESG controversy can be a priced risk factor.

2. Sample data construction

We use Refinitiv ESG scores (representing a company's activities and performance regarding ESG) and ESG controversies scores (representing issues or concerns surrounding ESG within a company) as our measures of ESG risk and ESG controversy risk. Both scores are measured on a scale from 0 to 100. The higher the ESG score, the more the company is considered an ESG leader, while a score closer to 0 indicates the company is an ESG laggard. Regarding ESG controversies scores, a firm's ESG

controversies score of 100 points means that the firm is free of ESG controversy risk, and higher scores indicate fewer ESG controversies. Because the media spotlight differs contingent on firm sizes, the Refinitiv dataset controls potential size biases in ESG controversies scores. Employing Refinitiv Datastream, we use firms' stock price and market value data on the NYSE, AMEX, and NASDAQ markets. The ESG dataset covers 5,598 firms including delisted firms to control for survivorship bias. We use each firm's ESG and ESG controversies scores from 2002 to 2020 and use 222 months of return and market value data from July 2003 to December 2021 for factor construction.

Table 1 shows the summary statistics of ESG and ESG controversies scores. We exploit 1,853 portfolios suggested by Hou, Xue, and Zhang (2020) as test portfolios, consisting of one-way value-weighted portfolios based on 188 anomalies.[1] Whether the dependent variable is individual stocks or portfolios is a sensitive issue because portfolios used in the analysis can significantly affect the outcomes of the asset price model (Lewellen, Nagel, and Shanken, 2010). By analyzing the large set of portfolios, we take advantage of a higher risk exposure stability and avoid biases due to the non-representative characteristics of small samples (Feng, Giglio, and Xiu, 2020).

We form value-weighted portfolios in the spirit of Fama and French (2008). They stress the over-representation of microcaps, which have a vast number of stocks in the total market but account for a small portion of the total market capitalization and are thus more prone to bias caused by outliers. We produce one-way ESG and ESG controversy factors using ESG and ESG controversy scores. Specifically, the firms are sorted into terciles by ESG scores to construct their ESG factor. Firms are also sorted by whether their ESG controversies scores are 100 points or not to construct the ESG controversy factor because companies with a score of 100 points account for more than half of the total. Using this sorting approach, we obtain three ESG-sorted portfolios (high, middle, and low) and two ESG controversy-sorted portfolios (100 points and non-100 points). Then, we construct ESG (controversy) long-short portfolios as ESG (controversy) factor by high (100 points) minus low (non-100 points). We refer to our ESG risk factor and ESG controversy risk factor as *ESG* and *ESGC* respectively. Regarding the timing of the rebalancing, the scores are sorted based on December of year t. The factor returns are calculated using the monthly stock returns of each firm from July of year t+1 to June of year t+2 to avoid look-ahead biases.

Table 2 presents summary statistics and correlation of the factors used in our analysis from July 2003 to December 2021 (222 observations). Panel A shows the summary statistics of the factors. The returns in Panel A are measured in percentage, and the mean (standard deviations) for *ESG* and *ESGC* are 0.031% (2.074) and -0.038% (1.345), respectively. In Panel B, the correlation coefficient between *ESG* and *SMB* is -0.455, and between *ESG* and *ROE* is 0.376, while the correlation coefficient between *ESG* and *SMB* is 0.531, and between *ESGC* and *ESG* is -0.451.

[1] The data source is https://global-q.org/testingportfolios.html.

3. Methodology

We first test whether our long-short portfolios have significant alphas. The specification for this test is as below:

$$ESGs_t = \alpha + X_t\gamma + \varepsilon_t, \text{ where } ESGs \in \{ESG, ESGC\}. \quad (1)$$

We choose the control variable set at time *t*, X_t, from the: Capital Asset Pricing Model (CAPM); Fama-French 3-factor model (FF3); Carhart 4-factor model (C4); Fama-French 5-factor model (FF5); q-factor model proposed by Hou, Xue, and Zhang (2015). α and ε_t denote the constant and error term, respectively. In the CAPM, *MKT* equals the market return ($R_{m,t}$) minus the risk-free rate ($R_{f,t}$) and $R_{f,t}$ is proxied by a one-month Treasury bill rate. In FF3, *SMB* and *HML* are the size factor and the value factor, respectively. In C4, *MOM* is the momentum factor obtained from Jensen, Kelly, and Pedersen's database.[2] In FF5, *RMW* and *CMA* are the profitability factor and the investment factor. R_f, *MKT*, *SMB*, *HML*, *RMW*, and *CMA* are obtained from the Kenneth French data library.[3] In the q-factor model, *IA* and *ROE* are the investment and profitability factors, respectively (Hou, Xue, and Zhang, 2020). We estimate the regression model using the Newey-West estimator with max-lag 6.

To test whether *ESG* and *ESGC* are risk factors, we employ two approaches using the Newey-West estimator with max-lag 6 under various sets of control factors corresponding to CAPM, FF3, C4, FF5, and q-factor. One is to measure the covariance risk prices for *ESG* and *ESGC* and the other is to measure their risk premia using Fama-MacBeth regressions.

The purpose of the first approach is to test whether the factors explain the cross-section of expected return well (Kan, Robotti, and Shanken, 2013). This covariance approach uses the covariance between portfolio return and factor return as the independent variable.

$$ER_p = \lambda_0 + \lambda_{ESGs}C_{ESGs} + \mathbb{C}\Lambda + \varepsilon_p, \text{ where } ESGs \in \{ESG, ESGC\}. \quad (2)$$

Here, ER_p means the average returns for each test portfolio p over the years. λ_0 and ε_p denote the constant and ~~error~~ term, respectively. C_{ESGs} indicates a covariance vector between returns of test portfolios and *ESG* or *ESGC*. λ_{ESGs} indicates the coefficient of C_{ESGs} and it interprets as a covariance risk price for *ESG* or *ESGC*. $\mathbb{C}$ indicates the covariance matrix between returns of test portfolios and control factors, and Λ means covariance risk prices for controls.

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[2] Jensen, Kelly, and Pedersen (2023) emphasize the replication issues in the asset pricing literature and provide replication data of hundreds of factors that have been introduced previously on their website. https://jkpfactors.com/.

[3] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/index.html

The second approach is the Fama-Macbeth regression, which consists of two estimation stages. This regression approach infers how risk compensation occurs.

$$ER_p = \gamma_0 + \gamma_{ESGs}\widehat{\beta_{ESGs}} + \hat{B}\Gamma + \varepsilon_p, \text{ where } ESGs \in \{ESG, ESGC\}. \quad (3)$$

Here, γ_0 indicates constant, $\widehat{\beta_{ESGs}}$ an exposure of *ESG* or *ESGC* estimated in the first stage, γ_{ESGs} a risk premium of *ESG* or *ESGC*, $\hat{B}$ control factors' exposures estimated in the first stage, and Γ control factors' risk premia.

4. Results

First, we examine whether *ESG* and *ESGC* exhibit pricing anomalies that cannot be explained by well-known factor models as in Eq. (1). While all α estimates of *ESG* are not significant in columns (1)-(5) of Table 3, those of *ESGC* are significantly negative, suggesting that *ESGC* is an anomaly whereas *ESG* itself is not. The negative α estimates mean that firms' expected stock returns are lower when they are less involved in ESG controversies.

Next, as in Eq. (2), we investigate whether *ESG* and *ESGC* have significant covariance risk prices when they are added to the existing factor model. Table 4 presents the estimation result of covariance risk prices for *ESG* and *ESGC*. The covariance risk price of *ESG* is significantly negative at the 1% level in CAPM (Model 1), significantly positive at the 1% level in FF3, C4, and FF5 (Models 2-4), and statistically insignificant in the *q*-factor model (Model 5). Therefore, the covariance risk price of *ESG* depends on which factor model is used as the control. In contrast, the covariance risk price for *ESGC* is significant and negative for all control factor sets (Models 1-5). ESG controversies as non-pecuniary components can possess unique characteristics that distinguish them from traditional financial factors, so it is plausible that ESG controversies provide a new dimension that is conducive to explaining the variation of expected returns.

Lastly, we report the results of the Fama-MacBeth regression to probe the existence of risk premia for *ESG* and *ESGC* according to Eq. (3) in Table 5. Similar to the results in Table 4, the risk premium of *ESG* is significantly negative at the 1% level in Model 6, significantly positive at the 1% level in Models 7-8, and not significant in Models 9-10. Therefore, *ESG* can be interpreted as not having a consistent risk premium. On the other hand, the risk premium of *ESGC* is significantly negative for all the control sets (Models 6-10), supporting the significant risk premium associated with the ESG controversy risk factor.[4]

~~Our~~ results support that ESG controversy, as opposed to ESG, is a potential risk factor. The

[4] These results are also consistent when ESG is divided into quartiles rather than terciles and when ESG and ESGC are regressed simultaneously.

ESG scores focus on how much a company is engaged in activities that enhance its relationship with stakeholders, while the ESG controversies score captures negative events that worsen the relationship between the company and stakeholders. If the ambiguity and subjectivity of ESG measurements cause an insufficient agreement on the definitions and attributes of ESG among vendors (Billio et al., 2021), investors may choose not to leverage information on ESG scores, resulting in the insignificant risk premium of the ESG factor. Thus, it is more likely that risk-return relationships will appear in channels where investors are spurred by ESG controversies and want to avoid companies regarding ESG controversy risk, rather than where they perceive ESG activities as mitigating risk (Bang, Ryu, and Yu, 2023).

5. Conclusion

We examine whether ESG and ESG controversies have the explanatory power of the cross-section of expected return and have risk premia. Investors exposed to only ESG risk do not expect compensation, indicating that ESG itself is an idiosyncratic risk. However, investors expect to be compensated for bearing ESG controversy risks. Furthermore, the ESG controversy factor has additional explanatory power for the cross-section of expected stock returns.

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Table 1
Summary statistics of ESG (controversies) scores

	ESG score					ESG controversies score				
	Obs.	Mean	Std	Min	Max	Obs.	Mean	Std	Min	Max
2002	754	31.28	15.39	3.96	76.04	753	84.93	25.58	3.33	100.0
2003	800	34.02	17.18	1.86	87.32	799	85.82	26.43	4.55	100.0
2004	1,055	33.97	17.49	1.90	87.62	1,052	87.56	25.33	1.72	100.0
2005	1,134	35.91	18.31	2.35	89.18	1,132	85.71	27.43	2.17	100.0
2006	1,139	37.77	18.11	2.02	92.27	1,137	84.15	26.56	2.63	100.0
2007	1,163	42.23	19.59	0.51	91.79	1,160	84.12	28.03	1.92	100.0
2008	1,460	42.22	21.03	0.60	94.93	1,456	82.49	30.22	1.32	100.0
2009	1,539	43.63	21.10	1.40	95.16	1,536	81.28	31.26	1.11	100.0
2010	1,592	44.52	21.02	1.02	93.55	1,589	75.43	33.43	0.79	100.0
2011	1,583	44.96	21.41	0.77	94.08	1,580	78.95	31.83	0.70	100.0
2012	1,574	45.29	21.09	0.88	93.89	1,572	79.63	31.79	0.74	100.0
2013	1,574	45.65	21.16	1.37	92.39	1,574	79.31	31.82	0.62	100.0
2014	1,678	45.04	20.73	0.63	92.89	1,678	81.83	30.74	0.67	100.0
2015	2,497	40.90	20.60	0.70	91.89	2,497	92.68	21.64	1.09	100.0
2016	3,234	39.22	20.10	0.44	92.06	3,234	91.86	22.40	0.67	100.0
2017	3,784	38.19	20.37	0.56	94.43	3,784	94.05	19.22	0.60	100.0
2018	3,935	39.21	20.49	1.68	94.63	3,935	92.71	21.28	0.91	100.0
2019	4,137	41.18	20.53	0.90	94.26	4,137	90.77	23.80	0.49	100.0
2020	4,380	43.37	20.54	4.32	95.29	4,380	88.47	26.12	0.50	100.0

Note. *Obs.*, *Mean*, *Std*, *Min*, and *Max* denote the number of observations, mean, standard deviation, minimum, and maximum value, respectively.

Table 2
Summary statistics and correlation
Panel A. Summary statistics of factors

	Obs.	Mean	Std	Min	25%	75%	Max
MKT	222	0.905	4.238	-17.230	-1.235	3.238	13.650
SMB	222	0.122	2.553	-8.300	-1.640	1.838	7.130
HML	222	-0.104	2.867	-13.950	-1.688	1.395	8.190
MOM	222	0.074	3.890	-26.797	-1.916	2.223	11.306
RMW	222	0.305	1.823	-4.150	-0.772	1.288	7.220
CMA	222	0.022	1.546	-3.250	-1.028	0.960	4.900
IA	222	-0.006	1.729	-3.710	-1.135	1.013	6.382
ROE	222	0.237	2.493	-14.373	-0.869	1.437	8.417
ESG	222	0.031	2.074	-5.115	-1.301	1.214	7.534
ESGC	222	-0.038	1.345	-5.214	-0.835	0.816	3.785

Panel B. Correlation matrix

	MKT	SMB	HML	MOM	RMW	CMA	IA	ROE	ESG	ESGC
SMB	0.408	1.000								
HML	0.241	0.340	1.000							
MOM	-0.324	-0.209	-0.437	1.000						
RMW	-0.234	-0.392	-0.029	-0.004	1.000					
CMA	-0.069	0.118	0.471	-0.113	-0.016	1.000				
IA	-0.045	0.173	0.512	-0.192	-0.035	0.899	1.000			
ROE	-0.452	-0.533	-0.274	0.518	0.534	-0.028	-0.108	1.000		
ESG	-0.200	-0.455	0.137	-0.047	0.329	0.288	0.214	0.376	1.000	
ESGC	0.297	0.531	0.103	-0.103	-0.260	-0.104	-0.089	-0.325	-0.451	1.000

Note. This table shows the summary statistics of the factors considered in our analysis (Panel A) and the correlation matrix among the factors (Panel B). *Obs.*, *Mean*, *Std*, *Min*, *25%*, *75%*, and *Max* denote the number of observations, mean, standard deviation, minimum, 25th percentile, 75th percentile, and maximum value of each factor, respectively.

Table 3
Tests of pricing anomalies

	(1)		(2)		(3)		(4)		(5)	
	ESG	ESGC	ESG	ESGC	ESG	ESGC	ESG	ESGC	ESG	ESGC
α	0.022	-0.221**	0.039	-0.205**	0.044	-0.204**	-0.069	-0.178**	-0.104	-0.180**
	(0.15)	(-2.49)	(0.29)	(-2.44)	(0.33)	(-2.43)	(-0.51)	(-2.09)	(-0.80)	(-2.26)
MKT	-0.094***	0.098***	-0.025	0.037	-0.031	0.037	0.009	0.027	0.047	0.022
	(-2.62)	(3.17)	(-0.70)	(1.10)	(-0.83)	(1.08)	(0.23)	(0.80)	(1.21)	(0.70)
SMB			-0.441***	0.276***	-0.440***	0.277***	-0.398***	0.270***	-0.346***	0.272***
			(-7.54)	(7.84)	(-7.54)	(7.90)	(-7.52)	(7.43)	(-6.93)	(6.20)
HML			0.242***	-0.048	0.229***	-0.049	0.129***	-0.010		
			(5.91)	(-1.07)	(6.02)	(-1.02)	(3.25)	(-0.18)		
MOM					-0.025	-0.003				
					(-0.80)	(-0.16)				
RMW							0.172	-0.030		
							(1.44)	(-0.56)		
CMA							0.359***	-0.128*		
							(3.75)	(-1.92)		
IA									0.381***	-0.137***
									(4.87)	(-3.18)
ROE									0.184**	-0.025
									(2.15)	(-0.59)
F-statistics	6.88***	10.03***	22.07***	26.41***	16.76***	20.33***	17.29***	17.38***	17.75***	21.65***
Adj.-R^2	0.038	0.088	0.296	0.290	0.294	0.287	0.361	0.300	0.317	0.308

Note. This table shows the results of testing whether ESG and ESGC are pricing anomalies. The figures in parentheses indicate Newey-West *t*-statistics with max-lag 6. *Adj.-R^2* denotes the adjusted *R*-squared. *, **, and *** indicate the significance at level 10%, 5%, and 1%, respectively.

Table 4
Estimation of prices of covariance risks

	Model 1			Model 2			Model 3			Model 4			Model 5		
constant	0.923***	1.074***	0.622***	0.821***	0.693***	0.760***	0.853***	0.719***	0.739***	0.684***	0.651***	0.711***	0.669***	0.670***	0.608***
	(27.55)	(22.79)	(12.62)	(15.50)	(12.01)	(14.39)	(13.43)	(11.03)	(11.36)	(12.74)	(11.95)	(13.08)	(9.68)	(9.71)	(9.44)
ESG		-0.039***			0.089***			0.089***			0.054***			-0.010	
		(-4.14)			(4.95)			(4.97)			(2.58)			(-0.59)	
ESGC			-0.132***			-0.143***			-0.145***			-0.127***			-0.204***
			(-7.70)			(-6.72)			(-6.83)			(-5.70)			(-9.37)
MKT	0.003	-0.010***	0.033***	0.012**	0.020***	0.020***	0.009	0.018***	0.022***	0.023***	0.023***	0.021***	0.023***	0.024***	0.032***
	(1.31)	(-2.93)	(7.78)	(2.57)	(4.19)	(4.44)	(1.53)	(3.12)	(3.82)	(4.66)	(4.61)	(4.35)	(3.66)	(3.68)	(5.38)
SMB				0.007	0.055***	0.045***	0.010	0.056***	0.044***	0.087***	0.114***	0.120***	0.025***	0.019*	0.092***
				(0.91)	(4.63)	(4.48)	(1.16)	(4.55)	(4.28)	(8.89)	(8.14)	(9.25)	(2.96)	(1.65)	(7.48)
HML				-0.036***	-0.064***	-0.037***	-0.039***	-0.067***	-0.034***	-0.100***	-0.108***	-0.084***			
				(-9.24)	(-9.10)	(-9.76)	(-6.97)	(-7.95)	(-5.99)	(-13.45)	(-13.6)	(-11.44)			
MOM							-0.004	-0.003	0.002						
							(-0.92)	(-0.76)	(0.55)						
RMW										0.145***	0.137***	0.135***			
										(9.77)	(8.80)	(9.28)			
CMA										0.057***	0.034**	0.015			
										(4.48)	(2.35)	(1.12)			
IA													-0.041***	-0.034**	-0.058***
													(-5.30)	(-2.31)	(-7.48)
ROE													0.049***	0.050***	0.056***
													(5.67)	(5.49)	(7.04)
F-statistics	1.72	8.84***	31.55***	42.07***	39.40***	41.65***	31.43***	31.36***	34.02***	60.36***	53.51***	50.73***	32.74***	26.22***	49.56***
Adj.-R^2	0.002	0.018	0.063	0.114	0.136	0.155	0.115	0.136	0.155	0.230	0.235	0.256	0.112	0.112	0.189

Note. This table shows the prices of covariance risks for the factors. The figures in parentheses indicate Newey-West *t*-statistics with max-lag 6. *Adj.-R^2* denotes the adjusted *R*-squared. *, **, and *** indicate the significance at level 10%, 5%, and 1%, respectively.

Table 5
Estimation of risk premia using Fama-MacBeth regressions

	Model 6			Model 7			Model 8			Model 9			Model 10		
constant	0.923***	1.074***	0.623***	0.821***	0.693***	0.760***	0.853***	0.719***	0.740***	0.684***	0.651***	0.711***	0.669***	0.670***	0.609***
	(27.55)	(22.79)	(12.63)	(15.50)	(12.00)	(14.39)	(13.43)	(11.03)	(11.36)	(12.74)	(11.94)	(13.08)	(9.68)	(9.71)	(9.45)
ESG		-0.152***			0.166***			0.162***			0.032			-0.060	
		(-4.19)			(3.34)			(3.31)			(0.63)			(-1.33)	
ESGC			-0.181***			-0.156***			-0.159***			-0.097***			-0.196***
			(-7.37)			(-6.11)			(-6.20)			(-3.95)			(-7.98)
MKT	0.046	-0.112**	0.376***	0.135**	0.254***	0.215***	0.101	0.227***	0.237***	0.206***	0.239***	0.203***	0.299***	0.298***	0.385***
	(1.31)	(-2.28)	(7.14)	(2.42)	(4.27)	(3.83)	(1.52)	(3.35)	(3.43)	(3.79)	(4.29)	(3.70)	(4.20)	(4.19)	(5.77)
SMB				0.009	0.068**	0.032	0.011	0.070**	0.031	0.176***	0.210***	0.199***	0.063**	0.056**	0.136***
				(0.29)	(2.33)	(1.05)	(0.36)	(2.35)	(1.02)	(6.32)	(6.47)	(6.20)	(2.26)	(2.05)	(4.12)
HML				-0.241***	-0.263***	-0.186***	-0.256***	-0.275***	-0.175***	-0.446***	-0.441***	-0.369***			
				(-8.86)	(-9.56)	(-6.88)	(-8.08)	(-8.64)	(-5.31)	(-15.32)	(-15.16)	(-12.39)			
MOM							0.070*	0.039	0.068*						
							(1.94)	(1.08)	(1.91)						
RMW										0.295***	0.288***	0.283***			
										(8.11)	(8.03)	(7.97)			
CMA										-0.050***	-0.057***	-0.072***			
										(-2.58)	(-2.92)	(-3.81)			
IA													-0.135***	-0.127***	-0.097***
													(-6.99)	(-5.03)	(-5.21)
ROE													0.132***	0.131***	0.135***
													(4.83)	(4.77)	(5.24)
Adj.-R^2	0.002	0.018	0.063	0.114	0.136	0.155	0.115	0.136	0.155	0.230	0.235	0.258	0.112	0.112	0.189

Note. This table shows the risk premia of the factors. The figures in parentheses indicate Newey-West *t*-statistics with max-lag 6. *Adj.-R^2* denotes the adjusted *R*-squared. *, **, and *** indicate the significance at level 10%, 5%, and 1%, respectively.