Measuring Skewness Premia
Online Appendix

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1 Predicted Total Skewness

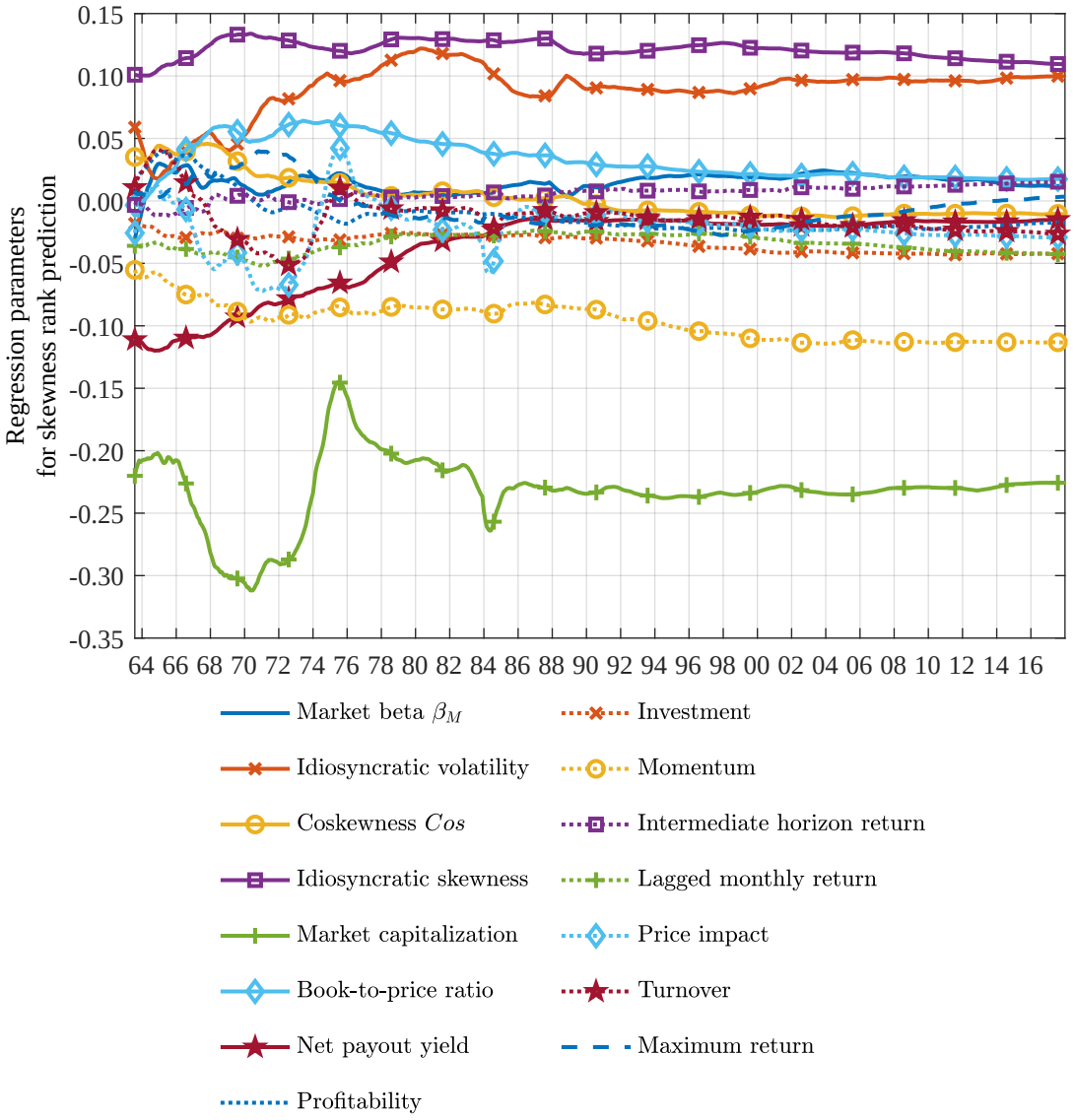

Figure 1 Coefficients of predictive panel regressions for total skewness ranks
We report the panel regression coefficients $\hat{\theta}$ and $\hat{\phi}$ from July 1963 to September 2017. Each month, we run a panel regression that predicts the next 12-month realized daily total skewness using past risk measures and stock characteristics. We use the cross-sectional rank of total skewness as the dependent variable and the cross-sectional ranks of past risk measures and characteristics as predictors. We use all past observations to estimate at each point in time the panel regression. The construction of all variables is detailed in Appendix 1 (in the main text).

Table 1 Summary statistics for panel regression coefficients to predict total skewness ranks

	Average	5^{th} percentile	95^{th} percentile
Market beta β_M	0.015	0.005	0.024
Idiosyncratic volatility	0.089	0.040	0.117
Coskewness Cos	0.003	−0.012	0.041
Idiosyncratic skewness	0.121	0.110	0.131
Market capitalization	−0.232	−0.294	−0.193
Book-to-price ratio	0.033	0.017	0.062
Net payout yield	−0.038	−0.111	−0.015
Profitability	−0.011	−0.023	0.031
Investment	−0.034	−0.043	−0.026
Momentum	−0.096	−0.114	−0.072
Intermediate horizon return	0.006	−0.007	0.014
Lagged monthly return	−0.034	−0.046	−0.025
Price impact	−0.021	−0.059	0.008
Turnover	−0.014	−0.042	0.018
Maximum return	−0.005	−0.024	0.033

We report summary statistics of panel regression coefficients $\hat{\theta}$ and $\hat{\phi}$ from July 1963 to September 2017. We compute the time-series average and 5^{th} and 95^{th} percentiles. Each month, we run a panel regression that predicts the cross-sectional rank of the daily total skewness computed over the next year using past risk measures and stock characteristics. We use the cross-sectional rank of total skewness as the dependent variable and the cross-sectional ranks of past risk measures and characteristics as predictors. We use all past observations to estimate at each point in time the panel regression. The construction of all variables is detailed in Appendix 1 (in the main text).

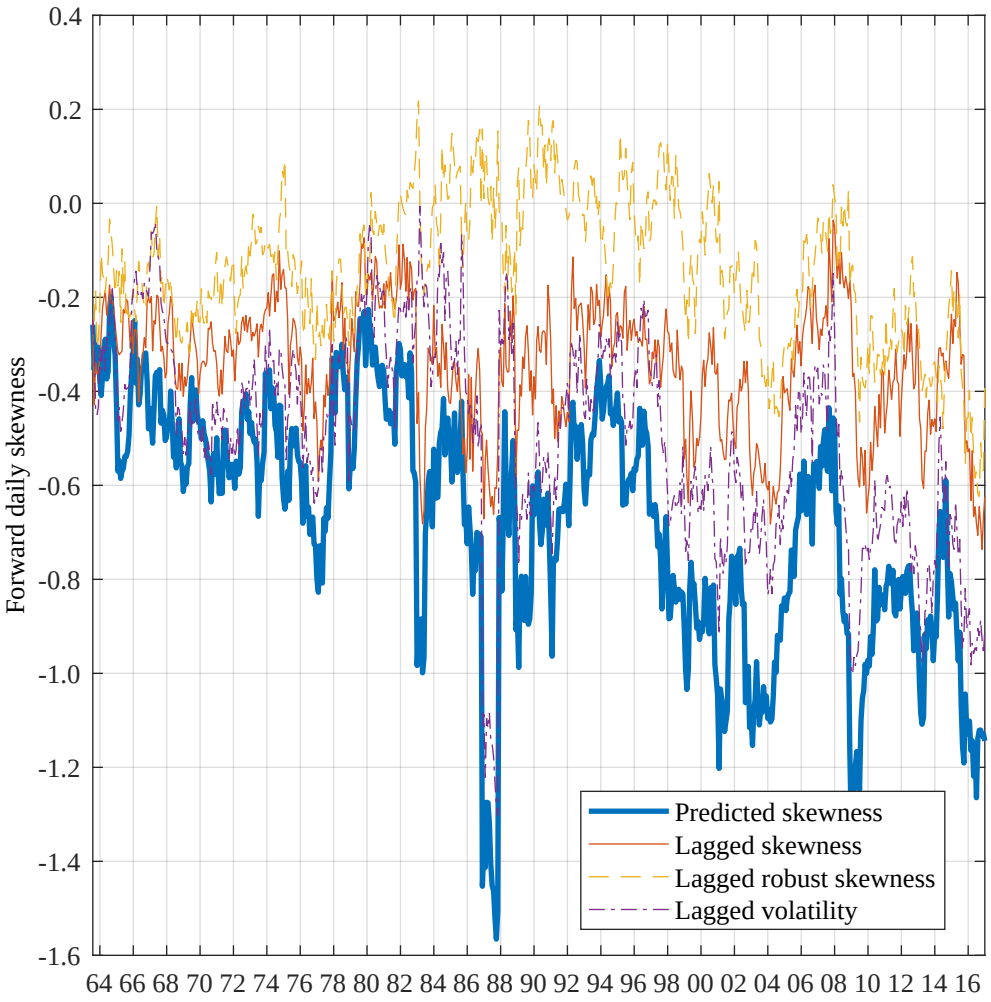

Figure 2 Equal-weighted average of stock-specific realized total skewness
We report equal-weighted average of stock-specific realized total skewness. Each month, we rank stocks based on a predictor of future total skewness. As predictors, we use daily return total skewness computed over the last year, daily quantile-based skewness, and daily volatility computed over the last year, and the panel regression forecasted total skewness cross-sectional ranks. We then compute each stock's daily return total skewness over the next year. For each predictor and each month, we report the equal-weighted average total skewness of the bottom 30% stocks minus the equal-weighted average total skewness of the top 30% stocks.

2 Robustness Checks for Skewness Sorted Portfolios

Table 2 Factor analysis of equal-weighted portfolios sorted by predicted quantile-based idiosyncratic skewness

Portfolio	$\alpha(\%)$	β_{MKT}	β_{PSS}	β_{HML}	β_{MOM}	β_{RMW}	β_{CMA}	*Adj.* R^2
Panel A: MKT, PSS								
Low	0.24	0.76	−0.06					0.82
	(3.02)	(25.87)	(1.09)					
Medium	0.24	1.05	0.17					0.87
	(2.50)	(38.91)	(2.42)					
High	−0.13	1.33	0.61					0.77
	(0.91)	(26.80)	(9.22)					
Low-High	0.37	−0.57	−0.67					0.52
	(2.61)	(9.21)	(9.90)					
Panel B: MKT, PSS, HML, MOM								
Low	0.12	0.80	−0.03	0.28	−0.00			0.87
	(2.02)	(38.18)	(0.98)	(5.64)	(0.10)			
Medium	0.24	1.04	0.25	0.24	−0.18			0.91
	(3.05)	(46.33)	(5.71)	(5.19)	(6.94)			
High	0.20	1.22	0.83	0.04	−0.59			0.85
	(1.24)	(28.31)	(14.77)	(0.47)	(7.46)			
Low-High	−0.09	−0.41	−0.87	0.24	0.59			0.67
	(0.53)	(8.71)	(13.74)	(2.21)	(6.07)			
Panel C: MKT, PSS, HML, RMW, CMA								
Low	−0.03	0.84	0.03	0.19		0.25	0.23	0.89
	(0.54)	(43.27)	(1.07)	(5.54)		(6.56)	(4.59)	
Medium	0.04	1.11	0.22	0.25		0.10	0.11	0.89
	(0.50)	(54.15)	(4.85)	(5.20)		(1.90)	(1.74)	
High	0.02	1.31	0.49	0.22		−0.57	−0.09	0.79
	(0.11)	(28.75)	(5.45)	(2.30)		(4.23)	(0.43)	
Low-High	−0.05	−0.47	−0.46	−0.04		0.82	0.32	0.59
	(0.24)	(9.43)	(5.09)	(0.34)		(5.31)	(1.39)	

We run time-series regressions of portfolio excess returns on different factor models. Each month, we run a panel regression that predicts the next 12-month realized daily quantile-based idiosyncratic skewness using past risk measures and stock characteristics (see Appendix 1 of the main text). We use the cross-sectional rank of quantile-based idiosyncratic skewness as the dependent variable and the cross-sectional ranks of past risk measures and characteristics as predictors. We form equal-weighted portfolios: one with the bottom 30% stocks with the lowest predicted quantile-based idiosyncratic skewness ranks (Low), one with the middle 40% stocks (Medium), one with the top 30% stocks with the highest predicted quantile-based idiosyncratic skewness ranks (High), and a low-minus-high portfolio. We use the Three-moment CAPM in which the market excess return (MKT) is augmented with the predicted systematic skewness factor (PSS) in Panel A, the modified four-factor model with MKT, PSS, value (HML), and momentum (MOM) factors in Panel B, and the modified five-factor model with MKT, PSS, profitability (RMW), and investment (CMA) factors in Panel C. For each regression, we report the monthly α in %, the factor exposures, and adjusted R^2. We report in parentheses the t-ratios using a Newey-West estimator with $T^{0.25} \approx 6$ lags. The sample period is July 1963 to September 2017.

Table 3 Factor analysis of value-weighted portfolios sorted by predicted quantile-based idiosyncratic skewness

Portfolio	$\alpha(\%)$	β_{MKT}	β_{PSS}	β_{HML}	β_{MOM}	β_{RMW}	β_{CMA}	*Adj.* R^2
Panel A: MKT, PSS								
Low	0.16	0.83	−0.20					0.93
	(3.82)	(42.28)	(8.60)					
Medium	−0.05	1.16	0.05					0.94
	(0.95)	(53.84)	(2.24)					
High	−0.36	1.37	0.47					0.84
	(3.27)	(28.88)	(9.27)					
Low-High	0.53	−0.53	−0.66					0.56
	(4.16)	(8.70)	(10.66)					
Panel B: MKT, PSS, HML, MOM								
Low	0.06	0.87	−0.23	0.09	0.11			0.94
	(1.48)	(70.98)	(11.66)	(2.64)	(5.22)			
Medium	−0.04	1.15	0.10	0.10	−0.10			0.95
	(0.71)	(60.08)	(4.98)	(3.48)	(3.85)			
High	−0.18	1.30	0.63	0.13	−0.40			0.89
	(1.58)	(39.44)	(11.85)	(2.14)	(7.82)			
Low-High	0.24	−0.43	−0.86	−0.04	0.51			0.70
	(1.73)	(10.41)	(12.70)	(0.48)	(7.46)			
Panel C: MKT, PSS, HML, RMW, CMA								
Low	0.00	0.88	−0.13	−0.02		0.24	0.20	0.95
	(0.02)	(77.86)	(7.31)	(0.82)		(6.12)	(3.95)	
Medium	−0.05	1.16	0.04	0.16		−0.10	−0.09	0.94
	(0.90)	(66.22)	(1.88)	(4.78)		(2.23)	(1.60)	
High	−0.22	1.34	0.36	0.35		−0.50	−0.27	0.86
	(1.59)	(35.04)	(6.39)	(4.19)		(5.63)	(2.12)	
Low-High	0.22	−0.46	−0.50	−0.37		0.74	0.47	0.64
	(1.28)	(9.96)	(7.07)	(3.66)		(6.32)	(2.79)	

We run time-series regressions of portfolio excess returns on different factor models. Each month, we run a panel regression that predicts the next 12-month realized daily quantile-based idiosyncratic skewness using past risk measures and stock characteristics (see Appendix 1 of the main text). We use the cross-sectional rank of quantile-based idiosyncratic skewness as the dependent variable and the cross-sectional ranks of past risk measures and characteristics as predictors. We form value-weighted portfolios: one with the bottom 30% stocks with the lowest predicted quantile-based idiosyncratic skewness ranks (Low), one with the middle 40% stocks (Medium), one with the top 30% stocks with the highest predicted quantile-based idiosyncratic skewness ranks (High), and a low-minus-high portfolio. We use the Three-moment CAPM in which the market excess return (MKT) is augmented with the predicted systematic skewness factor (PSS) in Panel A, the modified four-factor model with MKT, PSS, value (HML), and momentum (MOM) factors in Panel B, and the modified five-factor model with MKT, PSS, profitability (RMW), and investment (CMA) factors in Panel C. For each regression, we report the monthly α in %, the factor exposures, and adjusted R^2. We report in parentheses the t-ratios using a Newey-West estimator with $T^{0.25} \approx 6$ lags. The sample period is July 1963 to September 2017.

Table 4 Factor analysis of equal-weighted portfolios sorted by predicted quantile-based skewness

Portfolio	$\alpha(\%)$	β_{MKT}	β_{PSS}	β_{HML}	β_{MOM}	β_{RMW}	β_{CMA}	*Adj.* R^2
Panel A: MKT, PSS								
Low	0.25	0.74	−0.02					0.80
	(3.00)	(24.10)	(0.46)					
Medium	0.25	1.05	0.16					0.87
	(2.59)	(39.80)	(2.40)					
High	−0.15	1.35	0.59					0.77
	(1.04)	(26.80)	(8.98)					
Low-High	0.40	−0.62	−0.61					0.51
	(2.79)	(9.69)	(9.19)					
Panel B: MKT, PSS, HML, MOM								
Low	0.12	0.78	0.00	0.30	−0.01			0.85
	(1.96)	(33.93)	(0.13)	(6.09)	(0.34)			
Medium	0.24	1.05	0.25	0.24	−0.17			0.91
	(3.10)	(48.86)	(5.62)	(5.02)	(6.78)			
High	0.20	1.24	0.81	0.02	−0.59			0.86
	(1.19)	(28.65)	(14.53)	(0.29)	(7.32)			
Low-High	−0.07	−0.46	−0.81	0.27	0.58			0.67
	(0.44)	(9.42)	(12.91)	(2.52)	(5.85)			
Panel C: MKT, PSS, HML, RMW, CMA								
Low	−0.03	0.82	0.06	0.20		0.23	0.24	0.87
	(0.46)	(37.95)	(2.08)	(5.33)		(6.25)	(4.82)	
Medium	0.05	1.11	0.21	0.25		0.11	0.10	0.90
	(0.55)	(57.10)	(4.99)	(5.21)		(2.38)	(1.72)	
High	0.02	1.33	0.46	0.21		−0.58	−0.10	0.79
	(0.08)	(28.93)	(5.12)	(2.26)		(4.26)	(0.49)	
Low-High	−0.05	−0.51	−0.40	−0.02		0.82	0.35	0.59
	(0.21)	(9.83)	(4.49)	(0.16)		(5.30)	(1.52)	

We run time-series regressions of portfolio excess returns on different factor models. Each month, we run a panel regression that predicts the next 12-month realized daily quantile-based skewness using past risk measures and stock characteristics (see Appendix 1 of the main text). We use the cross-sectional rank of quantile-based skewness as the dependent variable and the cross-sectional ranks of past risk measures and characteristics as predictors. We form equal-weighted portfolios: one with the bottom 30% stocks with the lowest predicted quantile-based skewness ranks (Low), one with the middle 40% stocks (Medium), one with the top 30% stocks with the highest predicted quantile-based skewness ranks (High), and a low-minus-high portfolio. We use the Three-moment CAPM in which the market excess return (MKT) is augmented with the predicted systematic skewness factor (PSS) in Panel A, the modified four-factor model with MKT, PSS, value (HML), and momentum (MOM) factors in Panel B, and the modified five-factor model with MKT, PSS, profitability (RMW), and investment (CMA) factors in Panel C. For each regression, we report the monthly α in %, the factor exposures, and adjusted R^2. We report in parentheses the t-ratios using a Newey-West estimator with $T^{0.25} \approx 6$ lags. The sample period is July 1963 to September 2017.

Table 5 Factor analysis of value-weighted portfolios sorted by predicted quantile-based skewness

Portfolio	$\alpha(\%)$	β_{MKT}	β_{PSS}	β_{HML}	β_{MOM}	β_{RMW}	β_{CMA}	*Adj.* R^2
Panel A: MKT, PSS								
Low	0.18	0.81	−0.19					0.91
	(3.95)	(36.95)	(6.92)					
Medium	−0.03	1.14	−0.01					0.94
	(0.61)	(53.19)	(0.48)					
High	−0.40	1.39	0.39					0.84
	(3.62)	(27.98)	(7.41)					
Low-High	0.58	−0.59	−0.57					0.53
	(4.41)	(8.83)	(8.26)					
Panel B: MKT, PSS, HML, MOM								
Low	0.05	0.85	−0.22	0.11	0.12			0.93
	(1.18)	(60.80)	(9.72)	(2.92)	(4.56)			
Medium	−0.02	1.13	0.03	0.09	−0.09			0.95
	(0.33)	(59.87)	(1.54)	(3.34)	(3.51)			
High	−0.22	1.33	0.54	0.10	−0.39			0.88
	(1.85)	(35.84)	(8.79)	(1.37)	(6.32)			
Low-High	0.27	−0.48	−0.76	0.01	0.51			0.66
	(1.84)	(10.09)	(9.60)	(0.13)	(6.08)			
Panel C: MKT, PSS, HML, RMW, CMA								
Low	−0.01	0.86	−0.11	0.00		0.27	0.19	0.93
	(0.17)	(65.96)	(5.38)	(0.08)		(6.20)	(3.40)	
Medium	−0.05	1.14	−0.02	0.14		−0.06	−0.07	0.94
	(0.77)	(59.34)	(0.93)	(3.57)		(1.77)	(1.21)	
High	−0.23	1.36	0.28	0.33		−0.52	−0.30	0.86
	(1.60)	(34.14)	(4.83)	(3.68)		(5.71)	(2.36)	
Low-High	0.22	−0.50	−0.39	−0.32		0.79	0.50	0.62
	(1.21)	(10.10)	(5.32)	(2.95)		(6.32)	(2.84)	

We run time-series regressions of portfolio excess returns on different factor models. Each month, we run a panel regression that predicts the next 12-month realized daily quantile-based skewness using past risk measures and stock characteristics (see Appendix 1 of the main text). We use the cross-sectional rank of quantile-based skewness as the dependent variable and the cross-sectional ranks of past risk measures and characteristics as predictors. We form value-weighted portfolios: one with the bottom 30% stocks with the lowest predicted quantile-based skewness ranks (Low), one with the middle 40% stocks (Medium), one with the top 30% stocks with the highest predicted quantile-based skewness ranks (High), and a low-minus-high portfolio. We use the Three-moment CAPM in which the market excess return (MKT) is augmented with the predicted systematic skewness factor (PSS) in Panel A, the modified four-factor model with MKT, PSS, value (HML), and momentum (MOM) factors in Panel B, and the modified five-factor model with MKT, PSS, profitability (RMW), and investment (CMA) factors in Panel C. For each regression, we report the monthly α in %, the factor exposures, and adjusted R^2. We report in parentheses the t-ratios using a Newey-West estimator with $T^{0.25} \approx 6$ lags. The sample period is July 1963 to September 2017.