The nine style factors of EUE3 combine a total of 25 descriptors. This document defines all descriptors and provides their weights in the style factors. The descriptors are grouped by the styles they constitute.

Style:	**Size**

Definition: $0.5 \cdot LNCAP + 0.5 \cdot ASSI$

Components: $LNCAP$ Log of the month-end issuer capitalization.

$ASSI$ Log of total assets; an indicator of fundamental firm size.

Style:	**Liquidity**

Definition: $0.42 \cdot LSTOA + 0.36 \cdot LSTOQ + 0.22 \cdot LSTOM$

Components: $LSTOA$ Log of annual share turnover; an indicator of the average liquidity of an asset over one year.

$$LSTOA = ln\left(\frac{1}{NP} \sum_{t=T-NP+1}^{T} \frac{VOL_t}{NOS_t}\right)$$

VOL_t = monthly volume of shares traded at time t
NOS_t = number of shares outstanding at time t
NP = number of periods in sum, here NP = 12

$LSTOQ$ Log of quarterly share turnover; defined as $LSTOA$ with NP = 3.

$LSTOM$ Log of monthly share turnover; defined as $LSTOA$ with NP = 1.

Style:	**Momentum**

Definition: $0.24 \cdot HWALPHA + 0.36 \cdot MOM\_12\_1 + 0.4 \cdot MOM\_6\_1$

Components: $HWALPHA$ Historical weekly alpha. Intercept, α_i, of a regression of weekly asset returns, r_{it}, against weekly returns of the cap-weighted EUE3 estimation universe, r_{mt}.

$$r_{it} = \alpha_i + \beta_i r_{mt} + e_{it}$$

The regression uses 104 weeks of data and exponential weighting with a half-life of 52 weeks.

MOM_12_1 12-month relative strength, lagged by 1 month.

$$MOM\_12\_1 = \sum_{t=T-NP}^{T-1} ln(1 + r_{it}) - \sum_{t=T-NP}^{T-1} ln(1 + r_{0t})$$

r_{it} = monthly asset return at time t

r_{0t} = monthly risk-free return at time t

NP = number of periods in sum, here NP = 12

MOM_6_1 6-month relative strength, lagged by 1 month.
Defined as MOM_12_1 but uses NP = 6.

Style: **Volatility**

Definition: $0.53 \cdot HWBETA + 0.25 \cdot CMRA\_12\_0 + 0.22 \cdot DSTD\_65\_23$

Components: $HWBETA$ Historical weekly beta. Slope, β_i, of the regression (B.2).

$CMRA\_12\_0$ Cumulative range, defined as

$$CMRA = ln(1 + \max(Z_t)) - ln(1 + \min(Z_t))$$

$$Z_t = \sum_{s=1}^{t} ln(1 + r_{is}) - \sum_{s=1}^{t} ln(1 + r_{0s})$$

r_{is} = monthly asset return at time s

r_{0s} = monthly risk-free return at time s

$DSTD\_65\_23$ Daily asset volatility. Exponentially-weighted standard deviation of local daily asset returns. Uses 65 daily returns and a half-life of 23 days.

$$DSTD\_65\_23 = \left(\sum_{s=t-64}^{t} \lambda^{t-s}(r_{is} - \bar{r}_i)^2 \bigg/ \sum_{s=t-64}^{t} \lambda^{t-s} \right)^{1/2}$$

$\lambda = 0.5^{1/\tau}$ and $\tau = 23$ days

Style: **Value**

Definition: $0.62 \cdot BTOP + 0.38 \cdot SATOP$

Components: $BTOP$ Book-to-price ratio. The last published book value of common equity divided by the current issuer capitalization.

$SATOP$ Sales-to-price ratio. Sales over the last 12 months divided by the current issuer capitalization.

Style:	**Earnings Yield**	
Definition:	$0.1 \cdot ETOP + 0.17 \cdot CETOP + 0.13 \cdot ROE + 0.6 \cdot EPIBS$	
Components:	$ETOP$	Trailing earnings-to-price ratio. Net earnings over the last 12 months divided by the current issuer capitalization.
	$CETOP$	Cash earnings-to-price ratio. Cash earnings over the last 12 months divided by the current issuer capitalization.
	ROE	Return on equity. Net earnings over the last 12 months divided by the last available book value of common equity.
	$EPIBS$	Predicted earnings-to-price ratio. 12-month forward-looking earnings per share divided by current price. Forward-looking earnings per share are defined as follows:

$$EPS_{12F} = [M \cdot EPS_1 + (12 - M)EPS_2]/12$$

$EPS_1 = $ consensus of EPS forecasts for current fiscal year.
$EPS_2 = $ consensus of EPS forecasts for next fiscal year.
$M \quad = $ number of months remaining to end of current fiscal year.

Style:	**Dividend Yield**	
Definition:	$1.0 \cdot YILD$	
Components:	$YILD$	Annualized dividend per share divided by the current price.

Style:	**Leverage**	
Definition:	$0.59 \cdot BLEV + 0.41 \cdot MLEV$	
Components:	$BLEV$	Book leverage. Computed as

$$BLEV = \frac{BV + PF + LD}{BV}$$

$BV = $ most recent book value of common equity.
$PF = $ most recent book value of preferred equity.
$LD = $ most recent book value of long-term debt.

	$MLEV$	Market leverage. Defined in the same way as $BLEV$ but BV is replaced by the most recent issuer capitalization.

Style: **Growth**

Definition: $0.23 \cdot AGRO + 0.07 \cdot SAGRO + 0.05 \cdot EGRO + 0.5 \cdot EGRSF + 0.15 \cdot EGRLF$

Components:

$AGRO$ — Trailing growth of total assets. Slope coefficient of the reported total assets regressed against time over the last 5 years.

$SAGRO$ — Trailing growth of annual sales. Slope coefficient of the reported annual sales regressed against time over the last 5 years.

$EGRO$ — Trailing growth of annual net earnings. Slope coefficient of the reported annual net earnings regressed against time over the last 5 years.

$EGRSF$ — Short-term predicted earnings growth, defined as

$$EGRSF = \frac{EPS_{12F} - EPS_{12B}}{|EPS_{12B}|}$$

EPS_{12F} = forward-looking earnings per share, see (B.7).
EPS_{12B} = backward-looking earnings per share, defined as:

$$EPS_{12B} = [12 - M \cdot EPS_0 + (M)EPS_1]/12$$

EPS_0 = last reported earnings per share.
EPS_1 = consensus of EPS forecasts for current fiscal year.
M = number of months since end of last fiscal year.

$EGRLF$ — Long-term (3-5 years) predicted earnings growth, consensus of analyst estimates.

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