# Abbreviations

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| $\tilde{a}_i$ | Standardized log-return of firm $i$ |
| $\tilde{A}_T$ | Asset value at t = T |
| $\mathcal{B}(n,p)$ | Binomial distribution with parameters $n$ and $p$ |
| $\mathbb{C}$ | Set of all complex numbers |
| $\tilde{D}$ | Default event |
| $\mathbb{E}(\cdot)$ | Expectation value |
| $ES_\alpha^{(\infty)}$ | ES at confidence level $\alpha$ of a portfolio with infinite granularity |
| $\Delta l_1$ | First-order granularity adjustment |
| $\Delta l_2$ | Additional term of the second-order granularity adjustment |
| $\tilde{L}$ | Relative loss |
| $\tilde{L}_{\text{abs}}$ | Absolute loss |
| $\tilde{\tilde{L}}$ | Portfolio loss in an accurately adjusted ASRF model |
| $\mathcal{L}$ | Laplace transform |
| $\mathbb{N}$ | Set of all natural numbers |
| $\mathcal{N}(\mu,\sigma^2)$ | Normal distribution with expectation $\mu$ and variance $\sigma^2$ |
| $O(\cdot)$ | Landau symbol |
| $\bar{p}$ | Average probability of default |
| $p(\cdot)$ | Conditional probability of default |
| $\Delta p$ | Shift of the survival probability |
| $\mathbb{P}(\cdot)$ | Probability |
| $q_\alpha^{(n)}$ | Quantile of a granular portfolio |
| $q_\alpha^{(\infty)}$ | Quantile of an infinitely granular portfolio |
| $\Delta q$ | Shift of the loss quantile |
| $\Delta q_\alpha$ | Multi-factor adjustment |
| $\Delta q_\alpha^{\infty}$ | Systematic risk adjustment component of the multi-factor adjustment |
| $\Delta q_\alpha^{\text{GA}}$ | Granularity adjustment component of the multi-factor adjustment |
| $\bar{r}_{\text{Intra}}$ | Average intra-sector correlation |
| $\bar{r}_{\text{Inter}}$ | Average inter-sector correlation |
| $\mathbb{R}$ | Set of all real numbers |

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| $\mathbb{V}(\cdot)$ | Variance |
| $VaR_\alpha^{(\infty)}$ | VaR at confidence level $\alpha$ of a portfolio with infinite granularity |
| $VaR_\alpha^{(+)}$ | Lower VaR at confidence level $\alpha$ |
| $VaR_\alpha^{(-)}$ | Alternative definition of VaR: maximal loss in the best $100 \cdot \alpha\%$ scenarios |
| $VaR_\alpha^{(\text{int})}$ | Interpolated VaR at confidence level $\alpha$ |
| $\tilde{x}$ | Systematic factor |
| $\tilde{x}_s$ | Risk factor of sector $s$ |
| $\tilde{Y}$ | Systematic part of the portfolio loss |
| $\tilde{z}_k$ | Independent risk factors |
| $\tilde{Z}$ | General idiosyncratic component of the portfolio loss |
| $\mathbb{Z}$ | Set of all integers |
| $1_{\{\}}$ | Indicator variable |
| $\alpha^{(\infty)}$ | Quantile of an infinitely granular portfolio |
| $\bar{\beta}$ | Average weighted inter-sector correlation |
| $\Gamma$ | Gamma function |
| $\delta(\cdot)$ | Dirac's delta function |
| $\tilde{\varepsilon}_i$ | Idiosyncratic factor of firm $i$ |
| $\eta_m(\cdot)$ | $m$-th moment about the mean |
| $\eta_{m,c}$ | $m$-th conditional moment of the portfolio loss about the mean |
| $\mu_m(\cdot)$ | $m$-th moment about the origin |
| $\mu_{m,c}$ | $m$-th conditional moment of the portfolio loss about the origin |
| $\xi_i$ | Idiosyncratic factor of firm $i$ |
| $\rho$ | Risk measure |
| $\sqrt{\rho_i}$ | Correlation between firm $i$ and the common factor in a one-factor model |
| $\bar{\rho}_i$ | Correlation between obligor $i$ and the systematic risk factor $\widetilde{\bar{x}}$ |
| $\bar{\rho}_s$ | Correlation between sector factor $\tilde{x}_s$ and the systematic risk factor |
| $\rho_{s,t}^{\text{Inter}}$ | Correlation between the risk factors of sector $s$ and $t$ |
| $\rho_{\text{Intra}}^{(\text{Implied})}$ | Implicit intra-sector correlation |
| $\varphi$ | Standard normal PDF |
| $\varphi_2$ | Bivariate normal PDF |
| $\Phi$ | Standard normal CDF |
| $\Phi^{-1}$ | Inverse standard normal CDF |
| $\Phi_2$ | Bivariate normal CDF |
| $\mu$ | Drift rate or expectation value |
| $\mu_X$ | Parameter of the lognormal and logit-normal distribution |
| $B$ | Liabilities; Beta function; risk bucket |
| $b_i$ | Factor loading to the systematic factor |
| $b_k$ | Coefficients of sector factors |
| $CCF$ | Credit conversion factor |
| $CDF$ | Cumulative distribution function |

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| $c_i$ | Factor loading to the idiosyncratic factor; correlation parameter in the comparable one-factor model |
| *COMM* | Commitments |
| *D* | Diversity score |
| *DF* | Diversification factor |
| $d_i$ | Default threshold of obligor *i;* weighting factor in the model of Pykhtin |
| *EAD* | Exposure at default |
| $EC^{mf}$ | Economic capital in a multi-factor model |
| *EL* | Expected loss in relative values |
| $EL_{abs}$ | Expected loss in absolute values |
| *ELGD* | Expected LGD |
| *ES* | Expected shortfall |
| $ES_\alpha$ | ES at confidence level α |
| *f* | Probability density function |
| *F* | Cumulative distribution function |
| $F^{-1}$ | Inverse cumulative distribution function |
| *G* | Gini coefficient |
| *HHI* | Herfindahl–Hirschmann index |
| $I_c$ | Critical number of credits |
| *J* | Number of observations in a historical or Monte Carlo simulation |
| *k* | Number of defaults |
| *K* | Number of independent factors |
| *LGD* | Loss given default |
| $L_{j:J}$ | j-th out of *J* elements of the order statistics |
| *M* | Maturity; moment generating function |
| *n* | Number of credits |
| *N* | Number of observations |
| $n^*$ | Effective number of credits |
| $N_{\mathrm{PD}}$ | Number of PD-classes |
| *OUT* | Current outstandings |
| *p* | Survival probability (=1−α); probability of a direct default in the model of Davis and Lo |
| *PD* | (Unconditional) Probability of default |
| *PDF* | Probability density function |
| *q* | Infection probability in the model of Davis and Lo |
| $q_\alpha$ | Lower quantile |
| $q^\alpha$ | Upper quantile |
| $RC^s$ | Regulatory capital for sector *s* |
| *Res* | Residuum |
| *RR* | Recovery rate |
| *S* | Annual sales; number of Sectors |
| *SLGD* | Third moment of the LGD about the mean |
| *T* | Point in time |
| *TCE* | Tail conditional expectation |

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| $TCE_{\alpha}$ | Lower TCE at confidence level $\alpha$ |
| $TCE^{\alpha}$ | Upper TCE at confidence level $\alpha$ |
| $UL$ | Unexpected loss |
| $VaR$ | Value at risk |
| $VaR_{\alpha}$ | Lower VaR at confidence level $\alpha$ |
| $VaR^{\alpha}$ | Upper VaR at confidence level $\alpha$ |
| $VLGD$ | Variance of the LGD |
| $W$ | Wiener process |
| $w_i$ | Exposure weight of credit $i$ in the portfolio |
| $\alpha$ | Confidence level; parameter of the beta distribution |
| $\alpha_{i,k}$ | Factor weight of obligor $i$ from Cholesky decomposition |
| $\alpha_{s,k}$ | Factor weight of sector $s$ from Cholesky decomposition |
| $\beta$ | Target tolerance; parameter of the beta distribution |
| $\lambda$ | Fraction of the idiosyncratic risk that stays in the portfolio |
| $\sigma$ | Volatility or standard deviation |
| $\sigma_X$ | Parameter of the lognormal and logit-normal distribution |
| $\tau$ | Lagrange multiplier |