Appendix D

List of Algorithms

Algorithm 1 Blockbuster Algorithm (Brownlees et al. (2018))

Require: The return matrix $Y \in \mathbb{R}^{N \times T}$ and the number of groups $K \in \mathbb{R}^{+}$.

1: Compute the sample covariance matrix S.

2: Compute the eigenvectors corresponding to the K largest eigenvalues of S and construct the matrix $\tilde{U} \in \mathbb{R}^{N \times K}$.

3: Standardize each row of $\tilde{U}$ by its Euclidean norm to obtain the row-normalized sample eigenvector matrix X, where each element is computed as $x_{nk} = \frac{\tilde{u}_{nk}}{\|\tilde{u}_n\|_2}$.

4: Apply the K-means algorithm to the rows of X.

return K-means partition $\hat{\Pi}_K = \{\hat{\Pi}_1, \ldots, \hat{\Pi}_K\}$ as the estimate of the asset groups.

Algorithm 2 Adaptive Blockbuster Algorithm (De Nard (2022))

Require: The return matrix $Y \in \mathbb{R}^{N \times T}$.

1: Compute the sample covariance matrix $S = \frac{1}{T-1} YY'$, and its spectral decomposition $S = UVU'$.

2: Standardize the sorted eigenvalue vector $\tilde{V} = \mathrm{sort}(\mathrm{diag}(V))$ by the Eucledian norm and denote it by Y, where each element is computed as $y_n = \frac{\tilde{v}}{\|\tilde{V}\|_2}$

3: Apply a Kernel Density Estimate to Y and compute the number of resulting local minimas M.

4: Use Y and $K = M + 1$ as inputs for the Blockbuster Algorithm (Algorithm 1).

return K-means partition $\hat{\Pi}_K = \{\hat{\Pi}_1, \ldots, \hat{\Pi}_K\}$ as the estimate of the asset groups.
