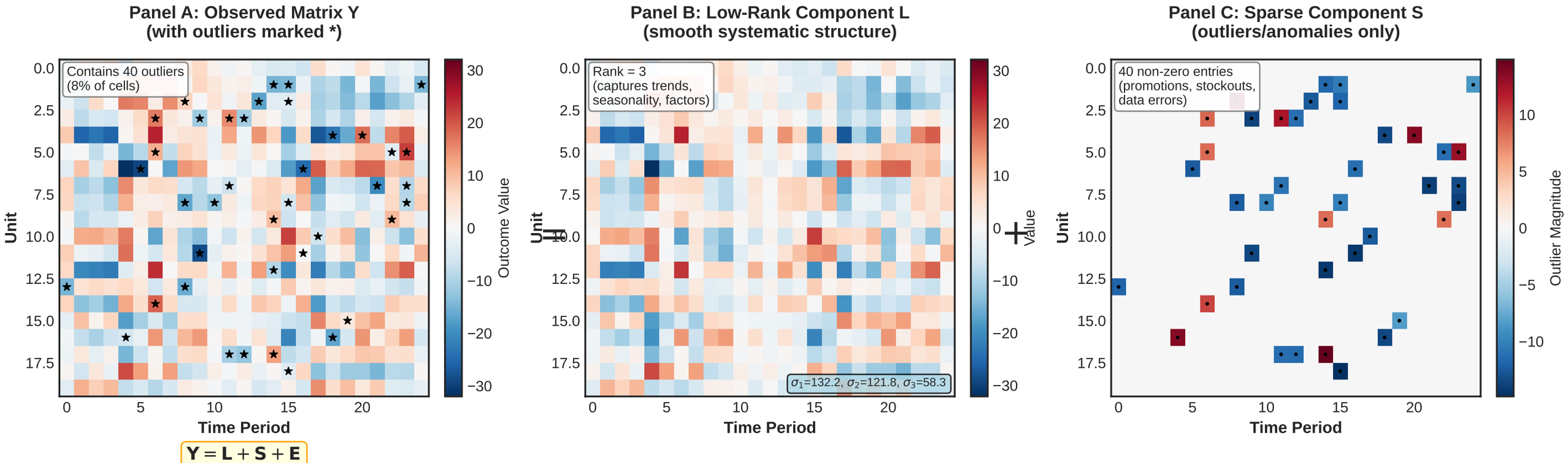
Robust Matrix Completion: Decomposing Y = L + S + E



Panel A: Observed outcome matrix with outliers (*). Panel B: Estimated low-rank component capturing systematic trends and factor structure.
Panel C: Estimated sparse component isolating outliers (promotions, stockouts, anomalies). Counterfactuals use L only; S identifies cells requiring special treatment.