12_DFE

QuantFit Estimator Standard Operating Procedure

SOP: Dynamic Fixed Effects (DFE)

Pooled panel ARDL with country-specific intercepts

=> DFE pools every coefficient (LR and SR) but allows country-specific intercepts.

1. Purpose

DFE imposes full homogeneity of slope and adjustment coefficients across countries while allowing fixed country intercepts. It is the most restrictive of the panel ARDL family.

2. When to use this estimator

Strong theoretical reason to pool every coefficient.

Slope homogeneity not rejected.

Small N (where MG / PMG cross-sectional averages are noisy).

3. Required data structure

Balanced panel.

Same I(0)/I(1) conditions as ARDL.

4. Mathematical formulation

Pooled UECM with within-transformation:

DeltaY_{i,t} = alpha_i + phi Y_{i,t-1} + theta' X_{i,t-1} + Sum ? DeltaY_{i,t-j} + Sum ?' DeltaX_{i,j,t-l} + epsilon_{i,t}

Within-demean to remove alpha_i, then pooled OLS.

Driscoll-Kraay SE for cross-sectional dependence.

5. Pre-estimation diagnostics

Slope homogeneity test.

Pesaran CD on the pooled residuals.

6. Estimation procedure

Within-demean each variable per country.

Pooled OLS on demeaned data.

Driscoll-Kraay SE with bandwidth = floor(T^{1/3}).

7. Output produced

8. Output interpretation

Same single-equation interpretation as ARDL but applied to a panel mean.

Heterogeneity rejection => DFE biases all coefficients; switch to MG / PMG.

9. Post-estimation diagnostics

CSD on residuals.

Slope homogeneity ex-post check.

10. Common pitfalls

DFE is strongly biased when slopes are heterogeneous (Pesaran-Smith critique).

Driscoll-Kraay SE require T moderately large.

11. Reporting checklist

Slope homogeneity test verdict.

Pooled long-run table with Driscoll-Kraay SE.

Pooled ECT.

Comparison to MG / PMG.

12. References

Pesaran, M. H., Smith, R. P. (1995). Estimating long-run relationships from dynamic heterogeneous panels.

Driscoll, J. C., Kraay, A. C. (1998). Consistent covariance matrix estimation with spatially dependent panel data.

Field | Meaning

longRunCoefficients | Pooled lambda? from -theta?/phi?

ect | Pooled phi?

shortRunCoefficients | Pooled DeltaX coefficients

standardErrors | Driscoll-Kraay