“Testing Jointly for Structural Changes in the Error Variance and Coefficients of a Linear Regression Model”
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MATLAB Program

This is a set of MATLAB program files which implement all the testing procedures discussed in the article. To replicate the empirical examples in Section 7, run script file `main.real.m` for the real interest rate example presented in Table 12. Run `main.inflation.m` for the inflation example in Table 13. The results are self explanatory.

The following function files compute the test statistics:

- `pslr0.m`: Computes the $\sup LR_T$ test statistic for m coefficient changes given no variance changes;
- `pslr1.m`: Computes the $\sup LR_{1,T}$ test statistic for n variance changes given no coefficient changes;
- `pslr2.m`: Computes the $\sup LR_{2,T}$ test statistic for n variance changes given m coefficient changes;
- `pslr3.m`: Computes the $\sup LR_{3,T}$ test statistic for m coefficient changes given n variance changes;
- `pslr4.m`: Computes the $\sup LR_{4,T}$ test statistic for m coefficient changes and n variance changes;

The $UD\max$ tests for each version can be computed by taking a maximum over a range of $1 \leq n \leq N$ for $\sup LR_{1,T}$ and $\sup LR_{2,T}$, over a range of $1 \leq m \leq M$ for $\sup LR_T$ and $\sup LR_{3,T}$, and over ranges of $1 \leq n \leq N$ and $1 \leq m \leq M$ for the $\sup LR_{4,T}$.

- `pslr9.m`: Computes the $SeqLR_{9,T}$ test statistic for m coefficient changes versus $m+1$ coefficient changes given n variance changes;
- `pslr10.m`: Computes the $SeqLR_{10,T}$ test statistic for n variance changes versus $n+1$ variance changes given m coefficient changes;

The following function files give the critical values:

- `getcv1.m`: Provides the critical values for $\sup LR_T$, $\sup LR_{1,T}$, $\sup LR_{2,T}$, and $\sup LR_{3,T}$ with `signif=1`, `2`, `3`, and `4` corresponding to the significance levels 10%, 5%, 2.5%, and 1%, respectively. `trm` is the trimming value (ϵ). The rows of the output `cv` represent the number of regressors (q for $\sup LR_T$ and $\sup LR_{3,T}$, 1 for $\sup LR_{1,T}$ and $\sup LR_{2,T}$) subject to change and the columns do the number of breaks (m for $\sup LR_T$ and $\sup LR_{3,T}$, n for $\sup LR_{1,T}$ and $\sup LR_{2,T}$).

- `getcv2.m`: Provides the critical values for $SeqLR_{9,T}$ and $SeqLR_{10,T}$ with `signif=1`, `2`, `3`, and `4` corresponding to the significance levels 10%, 5%, 2.5%, and 1%, respectively. `trm` is the trimming value (ϵ). The rows of the output `cv` represent the number of regressors (q for $SeqLR_{9,T}$ and 1 for $SeqLR_{10,T}$) subject to change and the columns do the number of breaks (m for $SeqLR_{9,T}$ and n for $SeqLR_{10,T}$).

- `getcv4.m`: Provides the critical values for $\sup LR_{4,T}$ with `signif=1`, `2`, `3`, and `4` corresponding to the significance levels 10%, 5%, 2.5%, and 1%, respectively. Input the trimming value (ϵ) `trm` and the number of regressors (q) subject to change, too. The rows of the output `cv` represent the number of coefficient breaks (m) and the columns do the number of variance breaks (n).

- `getdmax.m`: Provides the critical values for $UD\max LR_T$, $UD\max LR_{1,T}$, $UD\max LR_{2,T}$, and $UD\max LR_{3,T}$ with `signif=1`, `2`, `3`, and `4` corresponding to the significance levels 10%, 5%, 2.5%, and 1%, respectively. `trm` is the trimming value (ϵ). The rows of the output `cv` represent the number of regressors (q for $UD\max LR_T$ and $UD\max LR_{3,T}$, 1 for $UD\max LR_{1,T}$ and $UD\max LR_{2,T}$) subject to change. Use the first column of the output `cv` for the $UD\max$ tests. The second column is for the $WD\max$ tests discussed in Bai and Perron (1998).

- `getdmax4.m`: Provides the critical values for $UD\max LR_{4,T}$ with `signif=1`, `2`, `3`, and `4` corresponding to the significance levels 10%, 5%, 2.5%, and 1%, respectively. `trm` is the trimming value (ϵ). The rows of the output `cv` represent the number of regressors (q) subject to change. The four columns of the output correspond to cases of $(M, N) = (2,2), (3,2), (2,3)$, and $(3,3)$, respectively.