PRACTIONERS GUIDE:

Below is a step by step guide to the use of the method. For details refer to the main text of the paper.

Model Selection Criterion

1. Divide or partition the *N* series (N<T) in two groups, group one with *P* elements and group 2 with *Q* elements. Use approximately *Q=N/2*.

2. Assume that the correct number of factor is *L=1*.

3. Estimate by GMM or instrumental variables estimation the following system:

- Use the first *P-L* variables in group 1 as dependent variables for *P-L* equations.
- Use the *L* remaining variables in group 1 and a vector of ones as regressors for all dependent variables
- Use the *Q* variables in group 2 and a vector of ones as common instruments for all equations.

4. Compute the GMM over identifying restriction test statistic (Hansen, 1982).

5. Use the Hansen statistic to compute $MS_T(L) = Hansen(L) f(T)^{-1} - g(L)$ where $f(T)$ and $g(L)$ are defined according to BIC, BIC2 and BIC3 penalty criterions

6. Repeat steps 2 to 5 for *L=2, 3,.. (Q-1)*

7. The number of factor for this partition is the value of L that minimizes $MS_T(L) = Hansen(L) f(T)^{-1} - g(L)$

8. Repeat all steps for 100 different specification of the two groups. The number of factor estimated with the highest frequency is the estimated number of factors. For weak factors refer to the paper.

Sequential Hypothesis Testing

1. Repeat steps 1 to 4 from above.

2. Compare the Hansen statistic with $\chi^2[(P-L)(Q-L)]$,

- If the null hypothesis of *L* number of factor not is rejected, then L is the number of factor for this partition
- If the null hypothesis of *L* number of factor is rejected, then go to step 1 with

L=2, 3,.. (Q-1) and test again.

3. Repeat all steps for 100 different specification of the two groups. The number of factor estimated with the highest frequency is the estimated number of factors. For weak factors refer to the paper.