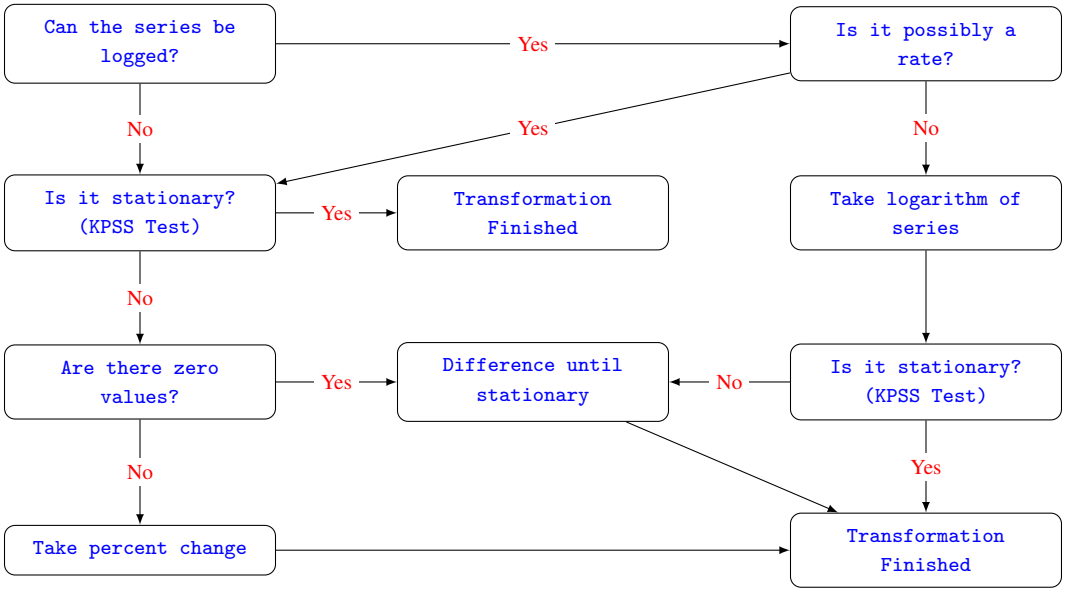
Package Name: MacroTrans
Date: 16th May 2015
Add-in Type: Group
Default Proc Name: MacroTrans
Interface: Dialogue (group proc) and command line

Description:

The add-in expands on the **GroupX12** addin, and takes **group** objects only and operates on them either through the command line or group proc. It takes each series and systematically transforms them ready for macroeconometric modeling, consistent with the 'T-Codes'/transformations used in prominent macro modeling papers (and, notably the factor literature, such as Stock and Watson (2005)). Details of the procedure can be seen in Figure 1.

The add-in takes a group object, and if required, checks for and seasonally adjusts each of the series using either the X-12 or X-13 (EViews 8 or later) algorithms developed by the United States Census Bureau. If the series can be logged (no negative or zero values), *and* it isnt solely bounded between zero and the rate max (i.e. - it isnt already an interest rate or bond yield), then it is logged. It then undertakes tests for stationarity, using either the KPSS or ADF tests. The maximum number of differencing is set to 2 (to change this, set !maxdiffs in macrotrans.prg), and the significance level on unit root tests is set to 5% (change !sig to 0,1,2 and !sigval to 0.01, 0.05 and 0.1 for 1%, 5% and 10% respectively). If the series is in logarithms and it is nonstationary, it is differenced, if it is not, and percentages can be taken (no zero values in constituent series), then they are, or, if they cannot, then the series is differenced.

Figure 1: A Transformation Schematic Based on the Macroeconometric Literature



The command line and GUI

The options are as follows, and can be seen in Figure 2 and Table 1 below. It is necessary to specify a suffix for the transformed output series (with the command line option **suffix="_<yoursuffix>"**, or in the edit box in the GUI, defaults to '_t'), and specify whether you would like all these series to be placed in a group together (include the term 'groupout' in the command line options). Of critical importance is the inclusion of a positive **rate=<yourrate>** option. This is to allow for the existence of things like bond yields or discount rates which should not be in logarithms (and in further developments of this add-in, may be subject to fractional integration tests). Other options include the choice of seasonal unit root test as mentioned above, with the inclusion of the options **seas="X13"** or **seas="X12"** and the choice of unit root test is introduced through the options **uroot="adf"** or **uroot="kpss"**. Finally, the inclusion of the option **standardize** standardizes the output series (subtracts the mean, divides by standard deviation), and the use of the option **tableout** creates a diagnostic table which shows the percent of series which are seasonally adjusted (as X-12 and X-13 sometimes encounter errors due to erroneous features of the series), the percent of series which have at least one unit root, the percent of series which are made stationary through a percentage change, and the percent of series which are logged. The table will be called *macrotrans_table01* if this name is not already taken.

Note that the group can be untitled, the add-in cannot be run on anything other than monthly or quarterly dated workfiles, that the constituent series cannot have any NA values, that the specified rate must be positive.

An Example

As an example, we take the dataset used in Stock and Watson (2005), made available in the replication files of Banerjee et al. (2014). We form a group of the 132 series and call it *macrotranstestgroup*. There are a few commented out lines of the *macrotrans.prg* which is dedicated to importing this data and creating the group. Using the command line interface, we type:

Figure 2: The GUI representation of the command line syntax

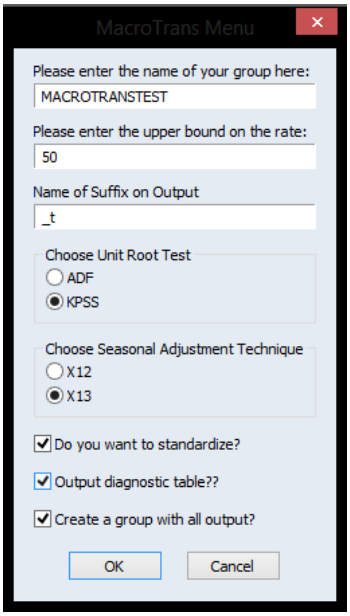


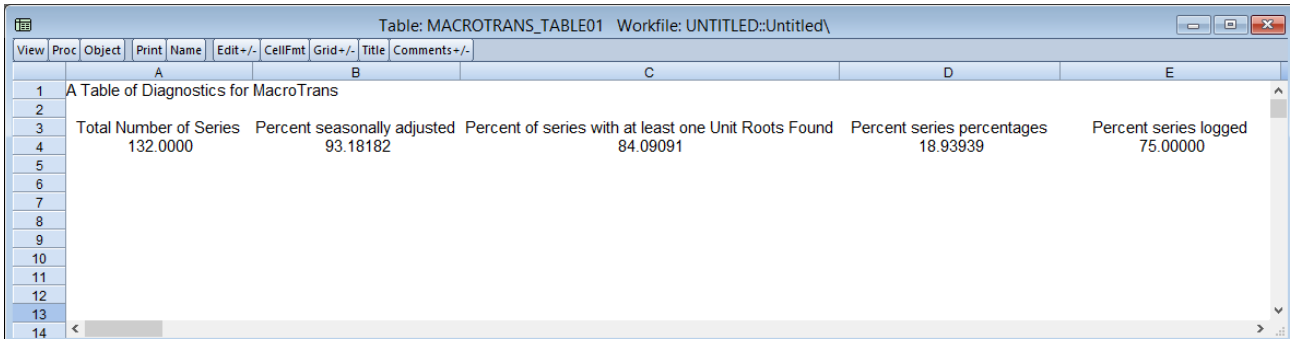
Table 1: A summary of the input options

Option Syntax	Optional Output Created
rate=X	Sets upper bound for interest rate/yield series.
suffix="_yoursuffix"	Declares the suffix for output series
unit="yourtest"	Specifies unit root test ('adf' or 'kpss')
seas="yourseas"	Specifies seasonal adjustment ('X12' or 'X13')
standardize	Standardizes all output
tableout	Creates an output diagnostic table
groupout	Creates an output group with all transformed series

macrotranstestgroup.macrotrans(rate=50,unit="kpss",seas="X13", suffix="_t",tableout,groupout)

As described above, this will give us transformed output series of the original name with a new suffix *_t* (while retaining the original series also), an output group called macrotranstestgroup_t, the upper bound on rates set to 50, unit root tests done using the KPSS test, seasonal adjustment completed using the X-13 algorithm, and a diagnostics table called macrotrans_table01 which can be seen in Figure 3, below:

Figure 3: An example using the Stock and Watson (2005) dataset



Further developments

If the command line syntax is used and does not have a specification for seasonal adjustment or unit root tests, it defaults to KPSS/X-13, although the code is easily modifiable to omit both procedures altogether (change !urootnumber and !seasonalnumber on lines 64 and 65 of the .prg respectively). As mentioned above, an obvious extension of the test is to incorporate different unit root or seasonal adjustment tests.

References

Banerjee, A., Marcellino, M., and Masten, I. (2014). Forecasting with factor-augmented error correction models. *International Journal of Forecasting*, 30(3):589–612.

Stock, J. H. and Watson, M. W. (2005). Implications of dynamic factor models for var analysis. Working Paper 11467, National Bureau of Economic Research.