

MICROFIT for WINDOWS

A Brief Introduction to the Computer Program

The aim of this note is to introduce students to the interactive and easy to use econometrics computer program Microfit for Windows, written by Pesaran and Pesaran. For more details on various aspects of the program users are directed towards the very comprehensible reference manual "Microfit 4.0: An Interactive Econometric Software Package" (by M. H. Pesaran and Bahram Pesaran publisher Oxford University Press, some copies of this manual are in the bookshop). This program is a development on the previous Mfit 3.0 program. To access the program you must be in windows and then it is in teaching economics and econometrics icon.

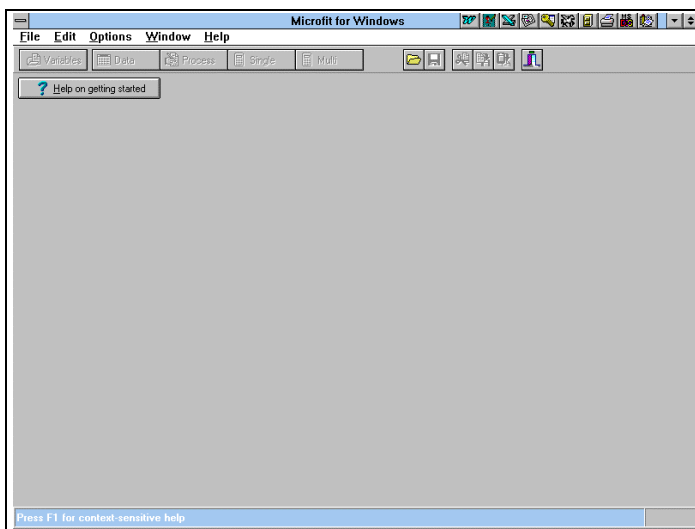


Figure 1:

The first screen you get within Mfit has the programme options running across the top, and these can be accessed (executed) either by using the Alt+underlined key (e.g. Alt+F accesses File, Alt+E accesses Edit, etc.) or by clicking on the name.

Reading in data

On selecting file there are a series of options, which are New... Open... Add... Save Save As View and Exit

New

This option enables you to enter your variables directly into MFIT by hand. On selecting New you are presented with Figure 2

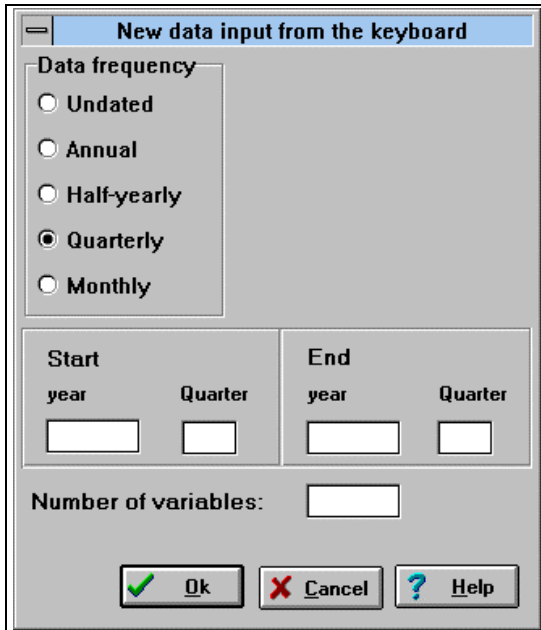


Figure 2:

Having fill in the appropriate elements of the table in Fig 2, the periodicity (either undated, annual, half-yearly, quarterly, or monthly), you must specify the number of observations, with quarterly data, that is, the start year and quarter as well as the end year and quarter. In addition you must enter the number of variables. Suppose you typed 1989:1 as the start year and quarter and 1992:4 as the end year and quarter and had selected 1 variable.

Then you will be presented with a screen (Figure 3) to enter the variable name (default X1) and a description of the variable.

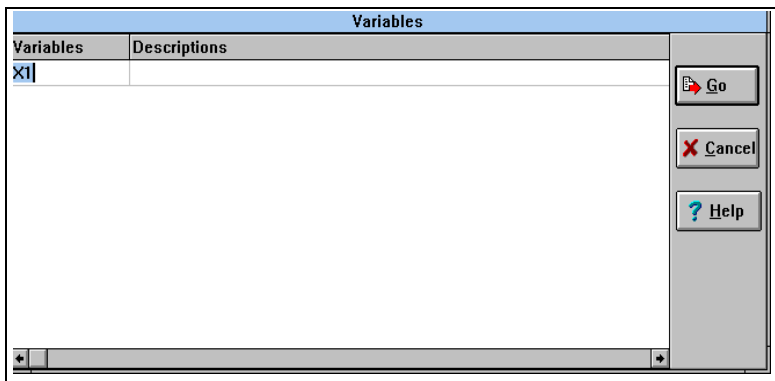


Figure 3

Variable names and description are included here, once you have entered details click **GO**.

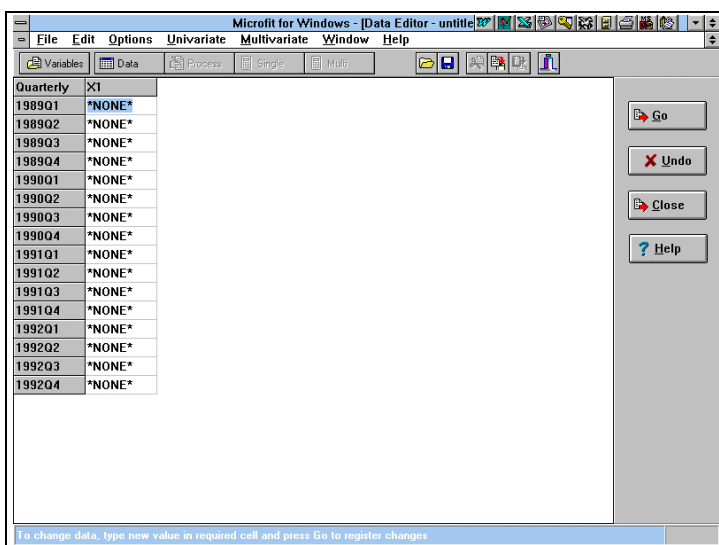


Figure 4

You are then presented with Fig 4, in which you type the actual data values. Having entered all data values for all series, click on Go (initially all values are set to *NONE* to indicate missing observations)

Open

Alternatively to typing the data into MFIT, you may have a data file which you wish to load into Mfit. This is one of the limitations of Mfit in that it does not take Lotus, Excel or QuattroPro files directly. Actually Mfit basically will only really take mfit (*.fit), comma separated value (*.csv) and ascii (*.prn and *.dat) files.

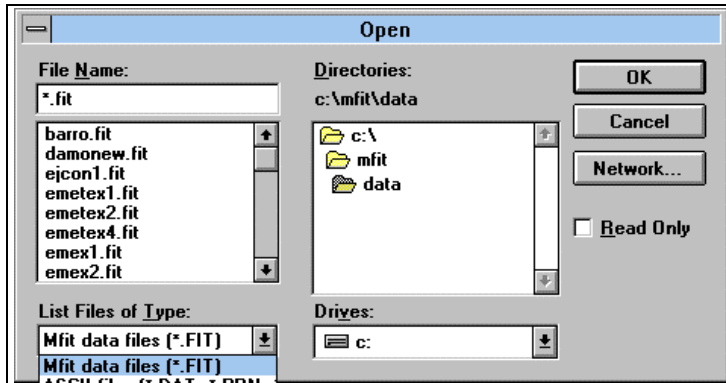


Figure 5

Clicking **Open** and you are presented with Fig 5, where you select the directory and the file type you wish to load.

If you are loading a Mfit file (*.fit), then all details regarding the file are stored in the file and no further information needs to be supplied. The only sensible alternative to *.fit files are ascii files as the programme itself warns against using *.csv files, which could take a considerable time to load.

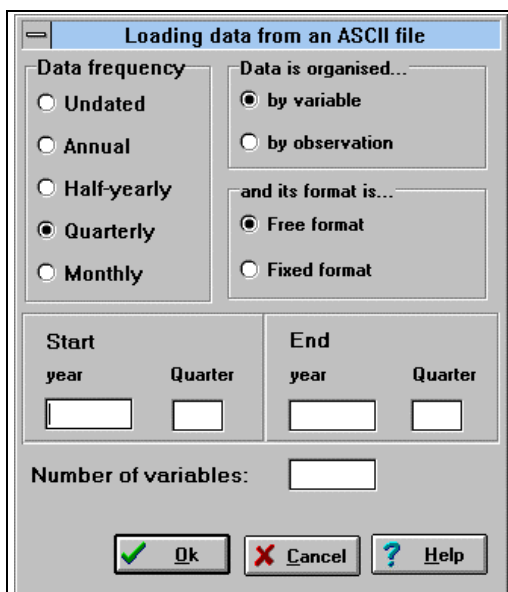


Figure 6

On loading an ascii file you are presented with Fig 6, which requires you to enter the periodicity of the data, the period over which the data runs and the number of variables. Having input these values and clicked OK you go to Fig 3 which requires you to give variable names to the variables and a brief description of the variables.

NOTE An ascii data file must contain the actual data **only**.

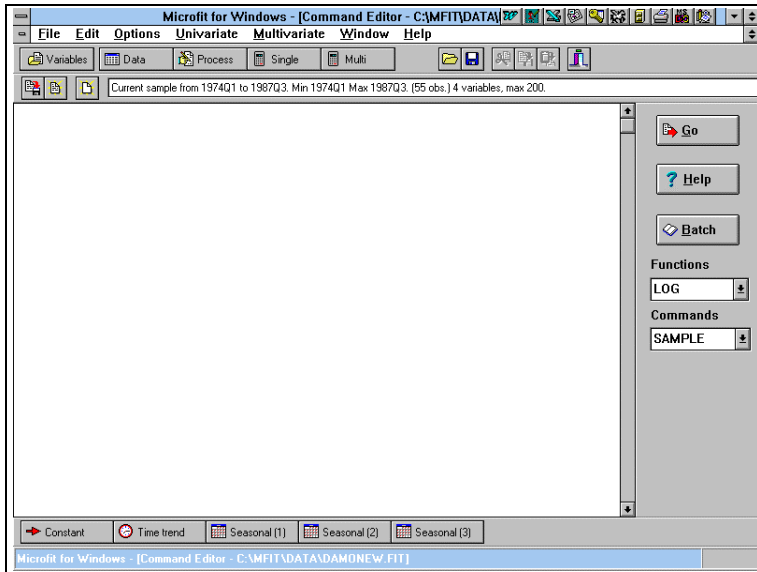


Figure 7

Fig 7 is the updated screen having successfully loaded in a datafile into Mfit (either as a *.fit, or *.dat or by hand) and you are now in a position to process the data. This is the processing screen.

Quarterly	ID	LRM	LRY	IB
1974Q1	0.094	11.6326	5.90366	0.154736
1974Q2	0.0955	11.6042	5.87382	0.177991
1974Q3	0.0955	11.5815	5.83782	0.170565
1974Q4	0.0955	11.6018	5.81225	0.152227
1975Q1	0.0885	11.5863	5.80395	0.134228
1975Q2	0.079	11.6045	5.78676	0.133481
1975Q3	0.076	11.6533	5.83341	0.128413
1975Q4	0.074	11.7642	5.92985	0.128836
1976Q1	0.072	11.7529	5.93765	0.141345
1976Q2	0.078	11.7655	5.93533	0.153119
1976Q3	0.08	11.7806	5.93175	0.160579
1976Q4	0.103	11.7702	5.94052	0.161833
1977Q1	0.097	11.7459	5.92804	0.166581
1977Q2	0.088	11.7687	5.93718	0.163021
1977Q3	0.095	11.7498	5.95655	0.169247
1977Q4	0.097	11.7487	5.9396	0.17289
1978Q1	0.099	11.7049	5.93241	0.171737
1978Q2	0.088	11.7034	5.93124	0.175708
1978Q3	0.081	11.703	5.97214	0.171193
1978Q4	0.077	11.7037	5.96873	0.182004
1979Q1	0.075	11.6789	5.96247	0.170043
1979Q2	0.077	11.7078	5.98649	0.168929
1979Q3	0.086	11.6762	5.98479	0.178275

Figure 8

Clicking on the **Data** icon (below **Options**) produces Fig 8, which lists the variables and their values and these data can be edited. Alternatively upon clicking the variables icon (below **File**) you are given Fig 3, which offers a description of the variables.

The options **A**dd enables you to merge together two data files, providing they have the same frequencies and cover similar time periods. The options **S**ave and **S**ave **A**s enable the user to save data files as *.fit files, and upon choosing the later option you are presented with a screen similar to that in Figure 5 offering you the option of saving the file to a specified directory and a specified name of your choice. Remember, that you must save your datafile once you have modified it, otherwise all the changes that you make will be lost. **V**iew enables you to look at old Mfit output files.

Clicking on the **P**rocess icon (below **Univariate**) you get Figure 7. This is the window in which you do the processing of the data, that is, data transformations, graphing and summary analysis.

To generate new variables you type the transformation that you wish and then click on GO, for example,

$X5 = X1/X2$ (this forms a new series X5 as the ratio of X1 to X2)

$X6 = X1 * X2$ (this forms a new series X6 as the product of X1 and X2)

$X7 = \log(X1)$ (this forms a new series X7 as the natural log of X1)

$X8=X2^2$ This forms a new series X8 as the square of X2)

$X9=X1-X1(-1)$ (This forms a new series X9 as the one period difference in X1)

$X10=normal(32)$ (This forms a new series X10 which is a normal random variable with mean=0 and variance=1, with a starting seed 32)

Functions list some of the other key operations/transformations that can be undertaken on your dataset.

To undertake a number of transformations in one run you would type, for example:

$X5=X1/X2$; $X6=X1*X2$; $X7=log(X1)$; $X8=X2^2$; $X9=X1-X1(-1)$; $X10=normal(32)$

and then click **GO**. Your dataset will now include these extra transformed variables, although the new variables will not be **SAVED** permanently into your dataset until you choose **File** and **Save** (or **Save As**) and save the new dataset.

NOTE: An alternative to undertaking the transformations interactively is to write a batch file (*.bat) within any text editor as

$X5=X1/X2$

$X6=X1*X2$

$X7=log(X1)$

$X8=X2^2$

$X9=X1-X1(-1)$

$X10=normal(32)$

and then click on the Batch icon (screen right) and load appropriate file and all the transformations specified will be undertaken.

The effect of choosing the Commands listed on the right of the screen should be obvious, but we will go through the more important ones.

SAMPLE 79Q1 89q4 (Enables you to change the sample period, in this case to 1979 quarter 1 to 1989 quarter 4)

LIST X1 X2 (Lists the values for the variables X1 and X2 over the specified sample period)

DELETE X3 (Delete the variable X3 from your data set)

KEEP X1 X2 (Deletes all variables, but X1 and X2)

COR X1 X2 (Reports summary statistics on the variables X1 and X2 including a correlation matrix between the two variables, if only on variable is specified you get the correlogram instead)

ADF X1(4) (Calculates the Augmented Dickey-Fuller Test on the variable X1 with up to 4 lags)

PLOT X1 (Gives a plot of X1 over time)

PLOT X1 X2 (Gives a plot of X1 and X2 over time)

XPLOT X1 X2 (Gives a cross plot with X1 up the vertical axis and X2 on the horizontal axis)

HIST X1 (Gives a histogram plot of the variable X1)

SCATTER X1 X2 (Gives a scatter plot of X1 against X2)

Again having chosen an operation you must click **GO** to activate that operation. Again to undertake a sequence of operation, either create a batch file, or type the operations on a single line separated by semi-colons. The plotting facilities within Mfit are extremely good, having chosen one of the five basic plots listed above you are presented with the

appropriate graph and options to print the graph, save the graph to a file, copy the graph to a clipboard (to paste into, for example, a Word document) and to edit the graph (last icon above the graph). On clicking on the **edit graph** option you get Figure 9

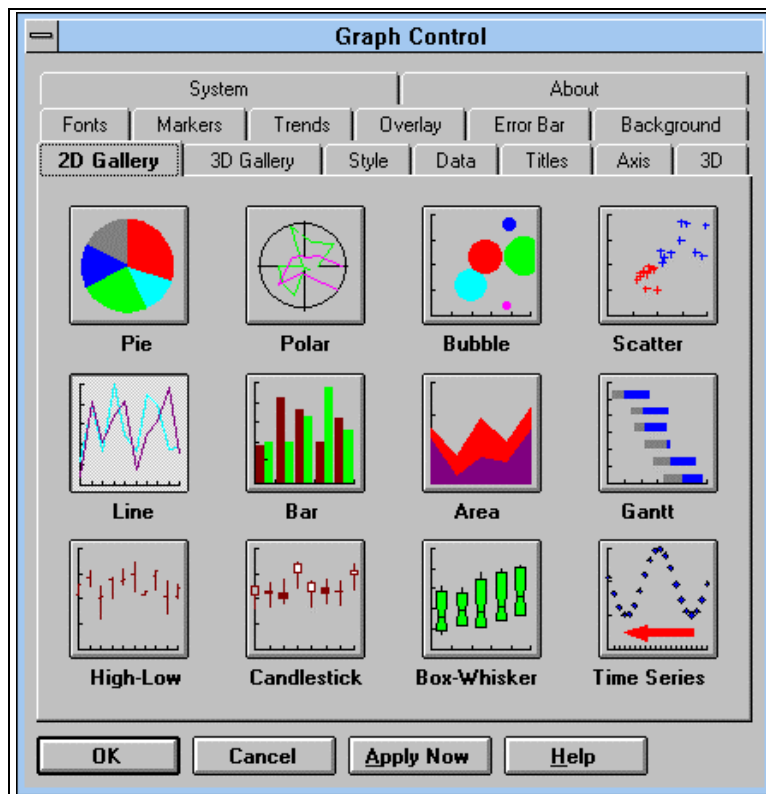


Figure 9

This allows the user to change almost all aspects of any graph, controlling the appearance of the axes, the graph titles, axis titles, as well as the actual graph itself (including the colours and line types used). On 3-D graphs one can even rotate the graph either around the horizontal or vertical axes to achieve the best results.

Univariate

This allows you to estimate univariate (single equation) models

1. Linear regression menu ➡
2. Recursive linear reg'n menu ➡
3. Rolling linear regression menu ➡
4. Non-linear regression menu ➡
5. Phillips-Hansen est'n menu ➡
6. ARDL approach to cointegration
7. Logit and Probit models

Corresponding to the Linear Regression option (1) there are 9 options:

1. OLS Ordinary Least Squares
2. IV(2SLS) Generalised Instrumental Variable Method
3. AR(J) Autoregressive Errors (Exact ML Method); $J \leq 2$
4. AR(J) Autoregressive Errors (Cochrane-Orcutt Iterative Method); $J \leq 12$
5. AR(J) Autoregressive Errors (Gauss-Newton Iterative Method)
6. IV/AR(J) IV with AR Errors (Gauss-Newton Iterative Method)
7. MA(J) Moving Average Errors (Exact ML Method); $J \leq 12$
8. IV/MA(J) IV with MA Errors; $J \leq 12$
9. GARCH-M estimation

On selecting any of these options Figure 10 appears:

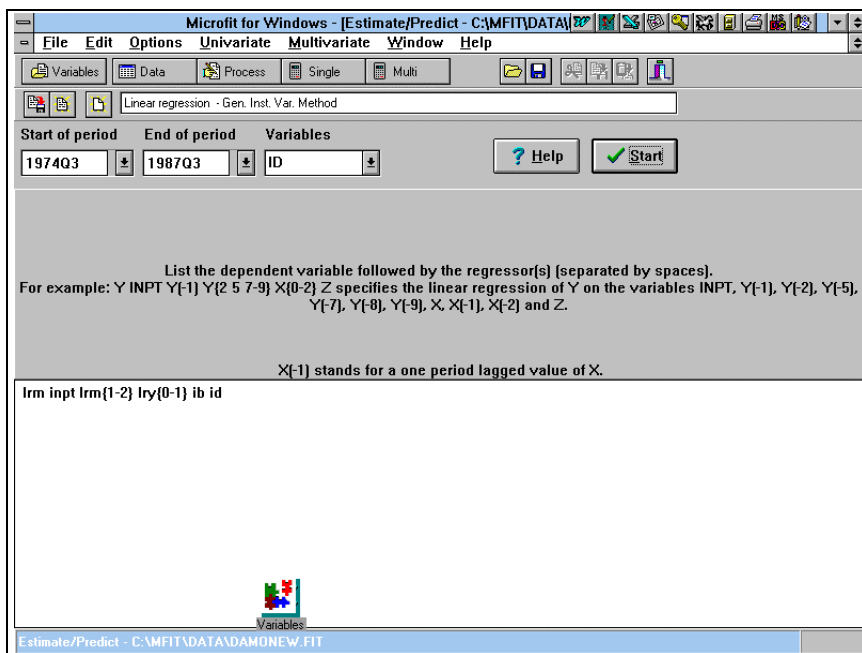


Figure 10: Select the dependent variable and the regressors following the instructions on the screen. On selecting OK, you are asked for a sample period and the results appear.

If instead of OLS you had selected option 2 (GIVE), you are asked via another screen to select the instruments used for estimation, for the other options listed above you will be asked the order of the AR/MA to be used on clicking on START. The results appear as in Figure 11

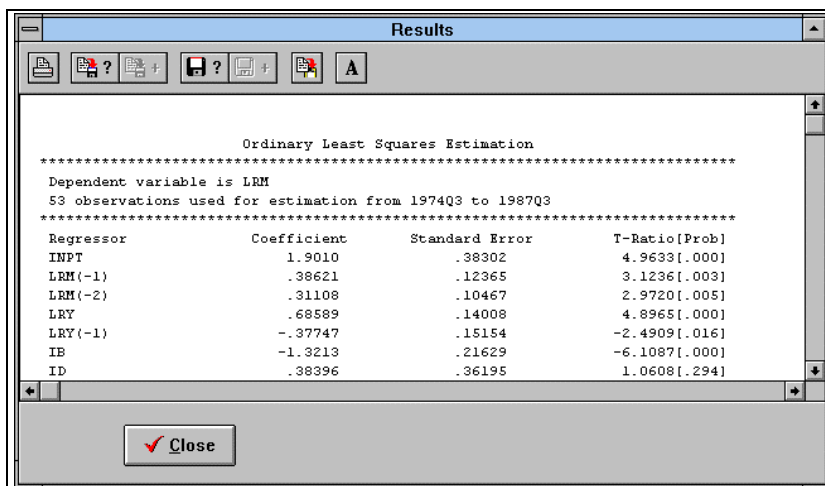


Figure 11 First icon enables printing of results, second icon saves the results to a file (and you get Fig 12). Third icon adds results to an opened file. Fourth icon opens a model file, the fifth adds to the model file, the sixth copies to a

clipboard and the last controls the form of the text in the output. This screen will follow-on from an regression that is run. You must remember to add results to your results file when you get them onto your screen otherwise they will be lost. Once the results have been saved to a file, this file can be edited either within Mfit or any other text editor (as the results file is an ascii file) and then printed.

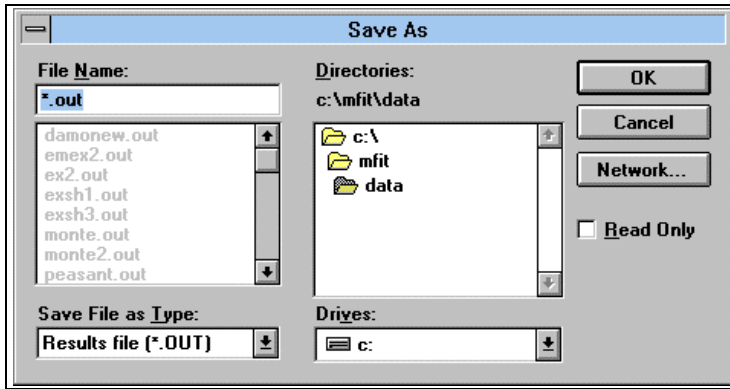


Figure 13
Enables you to write your results to a specified file and directory (files extensions on these results files are *.out). Remember, it is essential that you save all important results to a file, otherwise they will be lost.

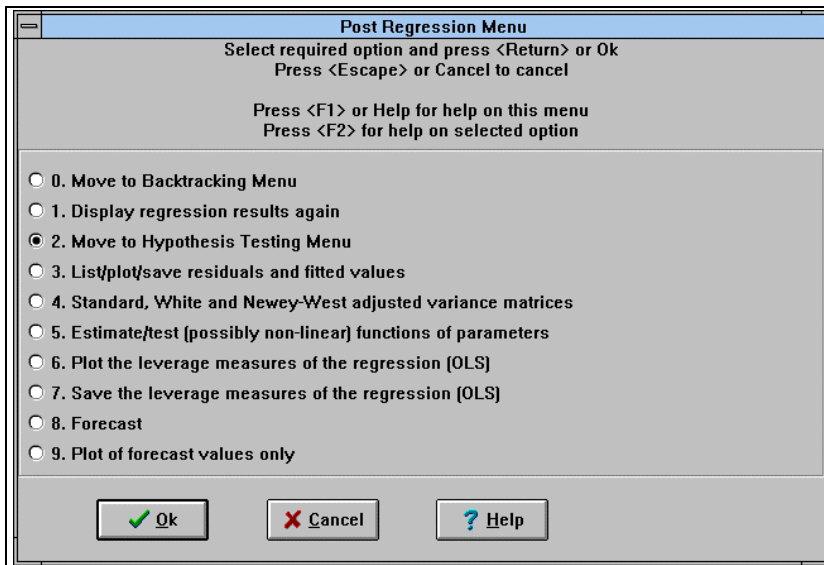


Figure 14
On selecting Close in Fig 12 you get Fig 14. This menu enables the user to look at various aspects of the model.

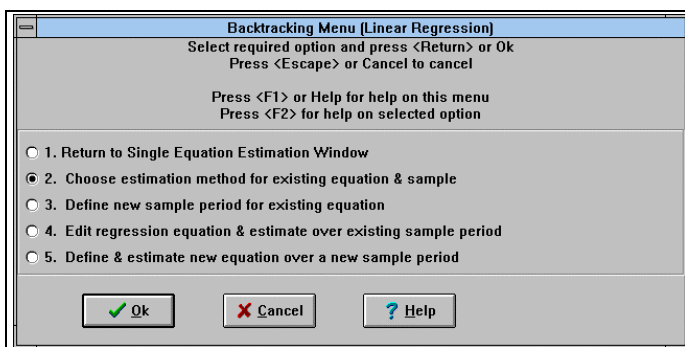


Figure 15
On selecting 0 in Fig 14 , you are able to respecify the equation, the sample period or the estimation method.

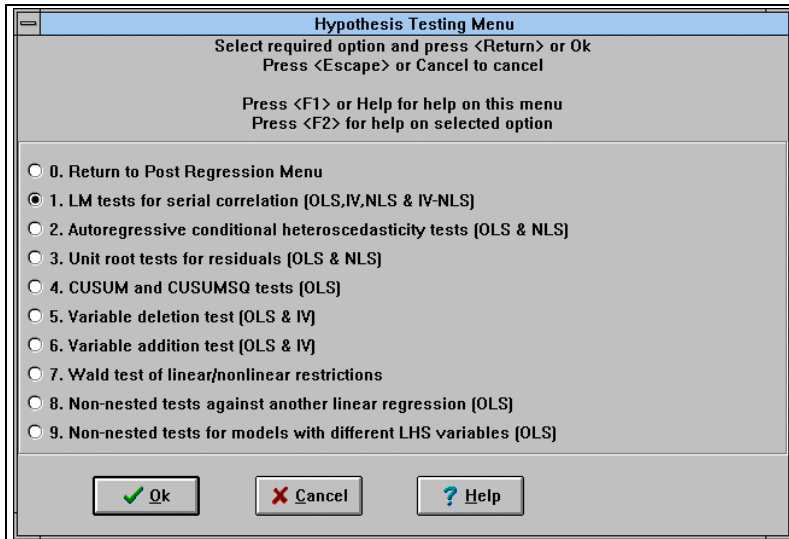


Figure 16
On selecting 2 in Fig 14 you get the hypothesis testing menu which allows extra testing of the CLRM assumptions (serial correlation, ARCH, unit roots, stability, and testing of extra variable and irrelevant variables and between alternate models.

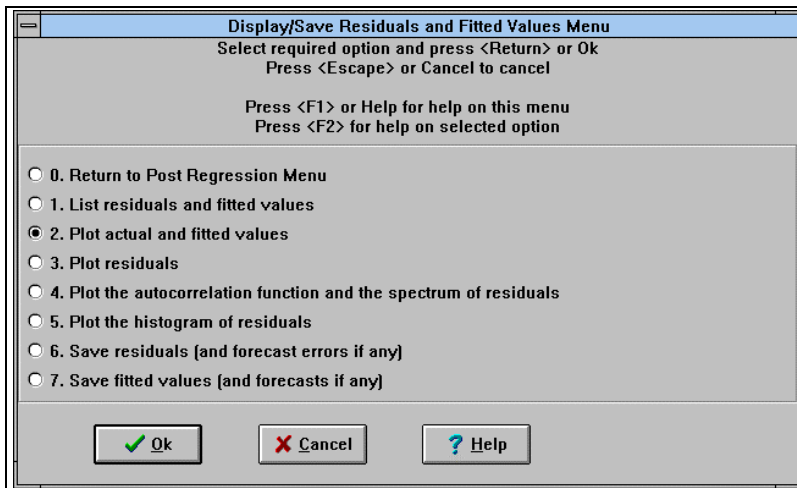


Figure 17
On selecting 3 in Fig 14, you get Fig 17, which enables you to look at the residuals (plots, correlograms and spectrums) as well as save both the residuals and the fitted values.

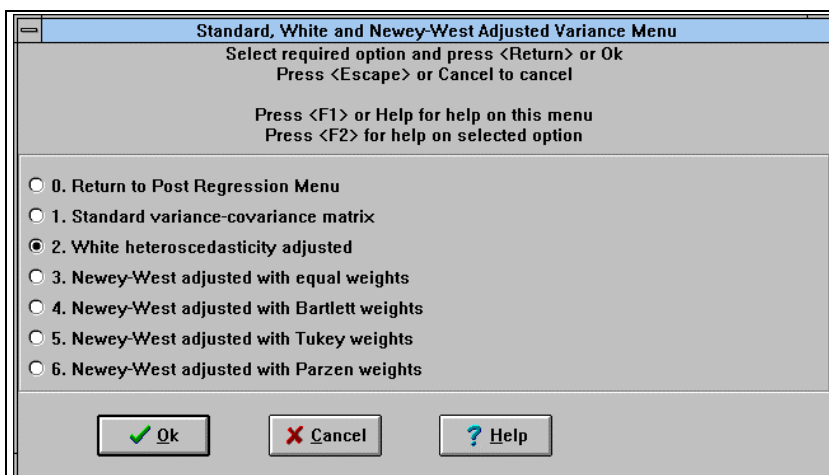


Figure 18
Selecting 4 in Fig 14 yields Fig 18, this can report the OLS var.-cov. matrix as well as the heteroscedastic consistent one of White and the serial correlation and heteroscedastic consistent ones of Newey-West.

The other options in the hypothesis testing menu concern leverage measures (which are measures of points of influence in your regression model) and forecasting options (these forecasting options can only be used if in estimation you left some points at the

end of your sample for forecasting and then stated when offered the question that you did wish to undertake forecasting analysis).

The other estimation option within Univariate analysis are

2. Recursive linear regression menu: This procedure estimates a model for the first n_1 observations, $t=1, \dots, n_1$, and these estimates are then updated by adding one extra observation to the sample and reestimating $t=1, \dots, n_1+1$ and then continuing in this fashion. This procedure is useful for investigating stability of the parameter estimates.

3. Rolling linear regression menu: This procedure estimates the model for the first n_1 observations, $t=1, \dots, n_1$, these estimates are then updated by moving the observations along one and estimating the model for $t=2, \dots, n_1+1$ and so on. This procedure is again useful for investigating stability of the parameter estimates.

4. Non-linear regression menu: Allows estimation of non-linear models.

5. Phillips-Hansen estimation menu: The fully modified correction to Engle and Granger estimation, used for cointegration analysis. Requires the specification of the presence of a drift parameter, the number of lags to use and the kernel density.

6. ARDL approach to cointegration: Involves a reparameterisation of an unrestricted highly dynamic model to yield long-run relationships.

7. Logit and Probit models: Used for cross-sectional data when the dependent variable is either zero or one.

Multivariate

This allows the specification and estimation of more than one equation

1. Unrestricted VAR

2. Cointegration VAR menu



3. SURE method

4. Restricted SURE method

On selecting any of the above options you get a screen similar to that in Figure 17, which requires you to specify the endogenous (dependent) as well as exogenous (right hand side) variables in the system of equations. Options 1 and 2 are fairly similar (the second a more general version of the first) and these will be discussed in more detail below. Options 3 and 4 will not be discussed further here.

On selecting option 2 you are required to state whether the deterministic elements (intercept and trend) are absent, restricted or unrestricted in the ECM. Then you are presented with Fig. 19.

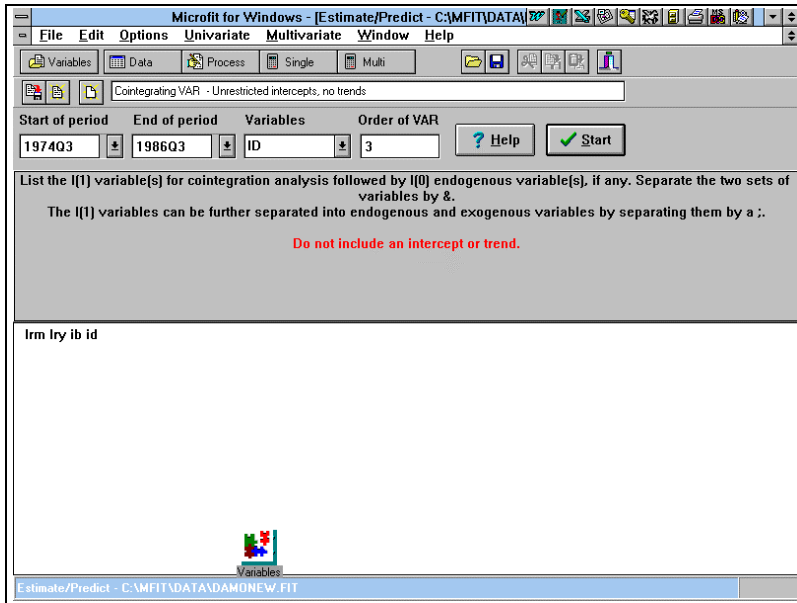


Figure 19: Selecting VAR cointegrating (2), you obtain Fig. 19. Where you must first list the endogenous I(1) variable of the system followed by the exogenous I(1) variables separated by a ; followed by the I(0) variables separated by an &. Also the order of the VAR must be specified.

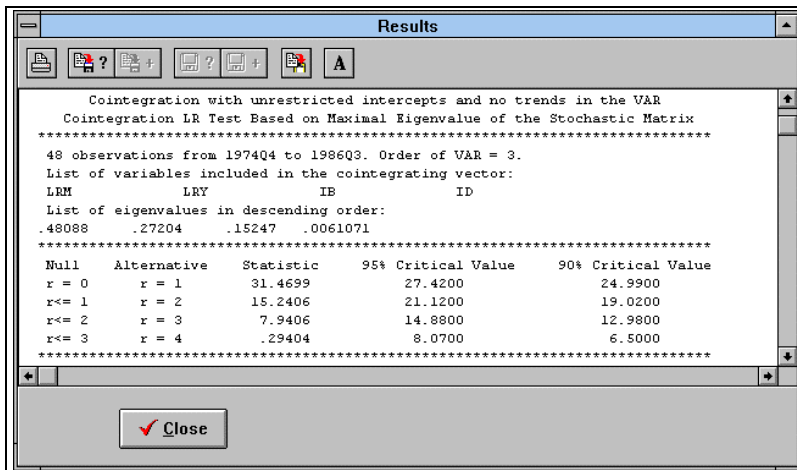


Figure 20 On clicking on Start, the output reports the eigenvalues and eigenvectors to determine the rank of Π and hence the number of cointegrating vectors. To save the results click the third icon. On pressing Close you get Fig 21

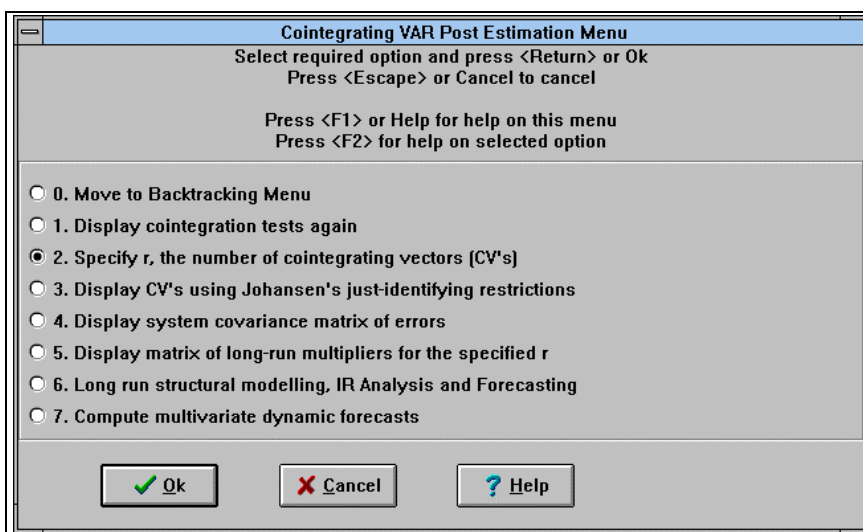


Figure 21 This presents the options available for specifying the number of cointegration vectors (2), reporting the vectors (3), the restricted Π matrix (5) and restrictions on the vectors (see Fig 22)

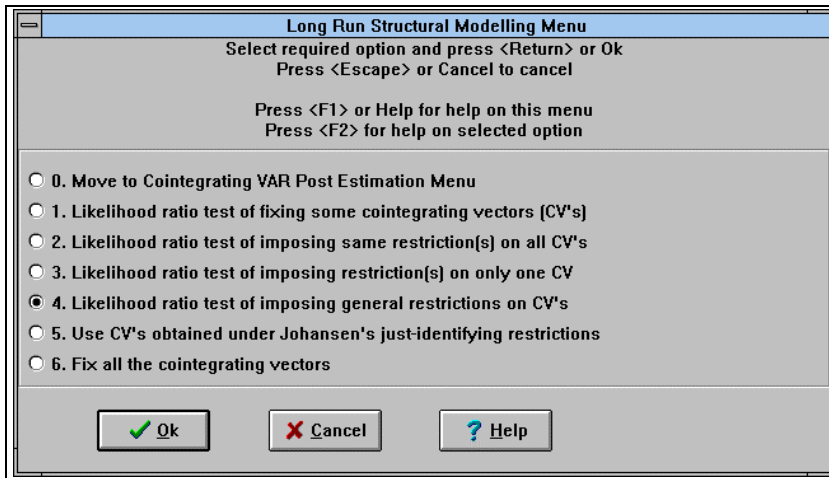


Figure 22
This figure presents the options available for imposing restrictions on the cointegrating vectors.

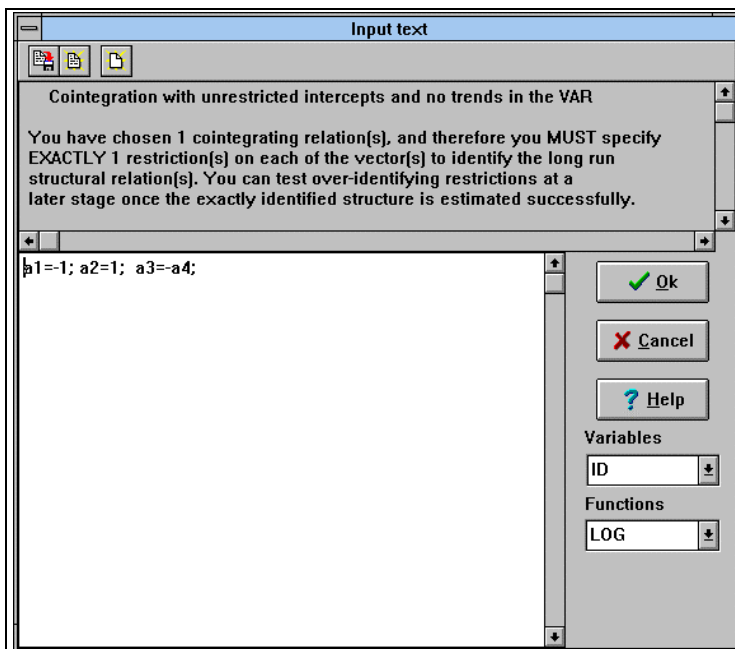


Figure 23
On selecting any of the options in Fig 22 yields something along the lines of Fig 23, which requires you to specify the form of restrictions on the cointegrating vectors. Once these have been specified click OK and providing they are valid (instructions of the form of the restrictions needed are written in the text above the window).

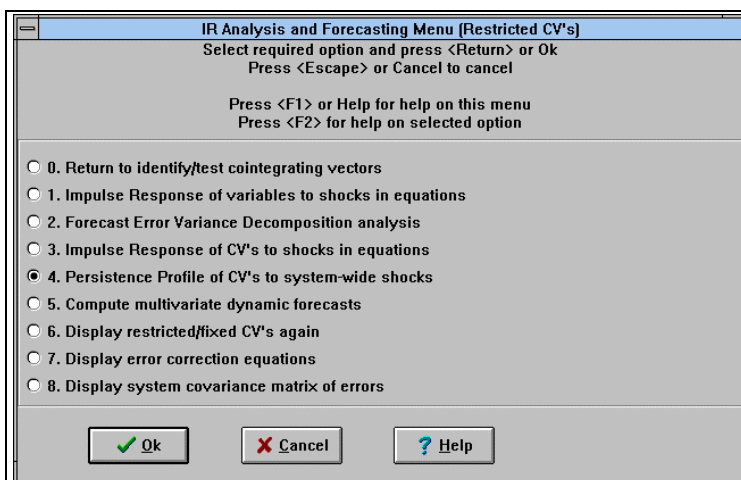


Figure 24
Having specified the restrictions and these having been imposed on the vector and reported you get Fig 24, which allows extra options to obtain greater details on the cointegrating vectors and the ECM.