How *WinSolve* works

1 What is *WinSolve*?

WinSolve is a user-friendly system for solving dynamic stochastic economic models. It is Windows based (although it runs on UNIX and DOS systems too) and menu driven. Information and a trial version can be obtained at `www.WinSolve.co.uk`.

It can be used for simulation and forecasting purposes, with any number of simultaneous equations. Models can be both nonlinear and forward-looking. For our purposes the program can also usefully be used to examine policy questions for DSGE models.

It is somewhat like econometric systems in the way it treats models, with sample periods and so on, but it does very little econometrics. This is a deliberate choice: Models need to be determined elsewhere. Models estimated in Eviews for example could be 'pasted' into *WinSolve* for further analysis.

2 How to use it

The following briefly outlines the features:

1. We need one equation for every endogenous variable, normalised on that variable. For example:

   ```
   cons = 0.75*cons(-1) - 0.1*int;
   ```

   would be the equation for `cons`. Equations are terminated with a ';'.

2. If there is no equation for any included variable then that variable is exogenous. `int` above, for example.

3. if a line starts with *p then what follows is treated as a parameter rather than a time series of a variable. This is very useful for setting up models with complicated parameter restrictions.

4. Equations are described in a natural language, i.e.:

```
*p rho = 4;
   x = 0.5*x(-1) + 0.5*x(+1) + rho*u/4;
   u = 0.1*u(-1);
```

This example includes a forward looking variable.

5. Every model needs data. *WinSolve* supports a wide variety of data formats, reading spreadsheets, econometric packages and raw data files.

6. If the model is linear, then the data can be arbitrarily set to 0.

7. A variety of sophisticated solution methods are available, including rational expectations and stochastic simulation.

8. All equations have 'adjustments', analogous to residuals. These are used to shock an equation, as in an impulse response, but are much more general. They can be multiplicative or additive. For example:

```
*m x = 0.5*x(-1);
```

then a shock of 0.73 would imply $x_t = (0.5x_{t-1}) \times 1.73$ for the period that it was set. Similarly:

```
*a x = 0.5*x(-1);
```

then a shock of 0.73 would imply $x_t = 0.5x_{t-1} + 0.73$.

The set types are used in stochastic simulation.

9. Control problems can be solved by specifying an instrument and an objective function.

10. *WinSolve* can now do control problems assuming a linear (or linearised) model and a quadratic objective, including time inconsistent and time consistent control.