∫ IRIS Macroeconomic Modeling Tutorials

SIMPLE SPBC MODEL: MODEL FILE

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Summary

This is a model file for a simple sticky-price business model. The model file describes variables, parameters and equations. Note that the model file does not specifies the tasks that will be performed with the model. The tasks will be set up in separate m-files, using standard Matlab functions and IRIS functions.

You cannot run the model file itself. Instead, load the file into Matlab using the function model function. See the m-file read_model for more details.

The IRIS model files can be syntax-highlighted in the Matlab editor; this makes the files easier to read. To this end, associate the model file extension(s) (which can be anything) with the editor. Open the menu File - Preferences, and click on the Editor/Debuger - Language tab. Use the Add button in the File extensions section to add new extensions, e.g. 'model'. Then restart the editor, and that's it.

CONTENTS

1   DECLARE VARIABLES, SHOCKS, PARAMETERS

```
22  !transition_variables
23
24      'Output' Y, 'Labor' N, 'Wage rate' W
25      'Nominal Marginal Cost' Q, 'Consumption Habit' H, 'Productivity' A
26      'Final Prices' P, 'Interest Rate' R,
27      'Price of Capital' Pk
28      'Rental Price of Capital' Rk
29      'Households Shadow Value of Wealth' Lambda
30      'Inflation Q/Q' dP, 'Inflation Y/Y' d4P, 'Wage Inflation Q/Q' dW
31      'Real Marginal Cost' RMC
32
33  !transition_shocks
34
35      'Consumption Demand Shock' Ey, 'Cost Push Shock' Ep,
36      'Productivity Shock' Ea, 'Policy Shock' Er
37      'Wage Shock' Ew
38
39  !parameters
40
41      'Long Run Growth !! \alpha' alpha, 'Discount !! \beta' beta, ...
42      'Labor Share !! \gamma' gamma, 'Depreciation !! \delta' delta,
43      k, pi, eta, psi
44
45      'Habit !! \chi' chi, 'Wage Stickiness !! \xi_w' xiw,
46      'Price Stickiness !! \xi_p' xip, rhoa, rhor, kappap, kappan
47
48      Short_, Infl_, Growth_, Wage_
49
50  %
```

2   DECLARE MEASUREMENT VARIABLES (AKA OBSERVABLES)

```
54  !measurement_variables
55
56      'Short Term Rate' Short, 'Price Inflation' Infl,
57      'Output Growth' Growth, 'Wage Inflation' Wage
58
59  !measurement_shocks
60
61      'Measurement Error on Price Inflation' Mp,
62      'Measurement Error on Wage Inflation' Mw
63
```

```
64  %
```

3   CONTROL LINEARISED AND LOG-LINERISED VARIABLES

By default, all variables are linearized in non-linear models. If you want some variables to be log-linearized instead, use the !log_variables section. Note how the keyword !all_but reverses the logic of this section – all variables will be log-linearized except those listed here.

```
74  !log_variables
75
76      !all_but
77      Short, Infl, Growth, Wage
78
79  %
```

4   WRITE MODEL EQUATIONS

```
83   !transition_equations
84
85       % Consumers.
86
87       P*Lambda =# (1-chi)/(Y - chi*H) !! P*Y*Lambda = 1;
88       Lambda = beta*R*Lambda{1} !! beta*R = alpha*pi;
89       H = exp(Ey)*alpha*Y{-1} !! H = Y;
90
91       'Wage Phillips Curve' xiw/(eta-1)*(dW/dW{-1} - 1) = ...
92         beta*xiw/(eta-1)*(dW{1}/dW - 1 + Ew) ...
93         + (eta/(eta-1)*N^psi/(Lambda*W) - 1) ...
94         !! eta/(eta-1)*N^psi = Lambda*W;
95
96       % Price of Capital.
97
98       Lambda*Pk = beta*Lambda{1}*(Rk{1} + (1-delta)*Pk{1});
99
100      % Supply Side.
101
102      'Production Function' Y = A * (N - (1-gamma)*$N)^gamma * k^(1-gamma);
103      gamma*Q*Y =# W*(N - (1-gamma)*$N);
104      (1-gamma)*Q*Y = Rk*k;
105
106      'Price Phillips Curve' xip/(eta-1)*(dP/dP{-1} - 1) = ...
```

```
107        beta*xip/(eta-1)*(dP{1}/dP - 1 + Ep) ...
108        + (eta/(eta-1)*RMC - 1) !! eta/(eta-1)*Q = P;
109
110     RMC = Q/P !! RMC = (eta-1)/eta;
111
112     % Productivity.
113
114     log(A/A{-1}) = rhoa*log(A{-1}/A{-2}) + (1-rhoa)*log(alpha) + Ea;
115
116     % Monetary Policy.
117
118     log(R) = rhor*log(R{-1}) + (1-rhor)*(log($R) ...
119        + kappap*(log(dP{4}) - log(pi)) ...
120        + kappan*(N/$N - 1)) + Er
121        !! d4P = pi^4;
122
123     % Q/Q and Y/Y Inflation Rates.
124
125     dP = P/P{-1};
126     d4P = P/P{-4};
127     dW = W/W{-1};
128
129  %
```

5   WRITE MEASUREMENT EQUATIONS

```
133  !measurement_equations
134
135     Short =  100*(R^4 - 1);
136     Infl = 100*((P/P{-1})^4 - 1 + Mp);
137     Wage = 100*((W/W{-1})^4 - 1 + Mw);
138     Growth = 100*((Y/Y{-1})^4 - 1);
139
140  %
```

6   WRITE DETERMINISTIC TRENDS ON MEASUREMENT VARIABLES

```
144  !dtrends
145
146     Short += Short_;
147     Infl += Infl_;
```

```
148      Growth += Growth_;
149      Wage += Wage_;
```

7   HELP ON IRIS KEYWORDS USED IN THIS FILE

Use either `help` to display help in the command window, or `idoc` to display HTML help in a browser window.

```
help modellang/transitionvariables
help modellang/transitionshocks
help modellang/parameters
help modellang/logvariables
help modellang/allbut
help modellang/transitionequations
help modellang/measurementvariables
help modellang/measurementequations
help modellang/dtrends
help modellang/sstateref
help modellang/sstateversion
```