`README.m` – Description of files.

Contents

- `setMyPath.m` - Set important paths
- `readDefinitions.m` - Stores important settings.
- Models/GPMPlus_`country`.model – The model
- `readModel.m` - Reads the model code, assigns parameters and creates an IRIS model object.
- `readData.m` - Creates historical database of measurement variables (observables).
- `estimateParams.m` - Estimates (some) parameters using regularized maximum likelihood.
- `printEstimationReport.m` - Creates a detailed report of the estimation and smoothing results.
- `runForecast.m` - Generates a conditional forecast based on USER-defined scenarios.
- `printForecastReport.m` - Creates a detailed report of the forecast(s).

`setMyPath.m` - Set important paths

- USER must specify the path to the appropriate version of IRIS.

`readDefinitions.m` - Stores important settings.

- `version` - A string that identifies version of current results (eg. April16).
- `country` - A 2-letter code identifying the country.
- various date ranges - Date ranges for estimation, smoothing and forecasting.

Models/GPMPlus_`country`.model – The model

- A text file containing the model written in IRIS's model code language

`readModel.m` - Reads the model code, assigns parameters and creates an IRIS model object.

- Reads model defined in Models/GPMPlus_`country`.model.
- USER must define values of calibrated parameters here.
- Saves model object in the current directory as `model.mat`.

`readData.m` - Creates historical database of measurement variables (observables).

- Constructs foreign observables based on a GPM6 projection and USER-SUPPLIED TRADE MATRIX.
- Loads domestic observables from the GPM database.
- Saves constructed data as an IRIS database object under `data.mat`.

`estimateParams.m` - Estimates (some) parameters using regularized maximum likelihood.

- USER must declare priors in the `E` structure.
- `model.mat` is estimated using `data.mat`.
- Smooths estimated model using `data.mat`.
- Results are stored in Results/|version|/estimation.mat.

`printEstimationReport.m` - Creates a detailed report of the estimation and smoothing results.

- Stored in Results/|version|/GPM_`country`_EstimationReport.pdf.
- Relies on the IRIS `report` object and LaTeX.
- Generated using various ad-hoc routines stored in Functions/ directory.

`runForecast.m` - Generates a conditional forecast based on USER-defined scenarios.

- Scenario name is defined in the `scenario` variable.
- Scenario is defined as a set of tunes to model variables/shocks, and it is declared as a `plan`.
- Uses the estimated model and smoothed history (as an initial condition) found in Results/|version|/estimation.mat.
- The forecast results are stored in Results/|version|/GPM_country_forecast_scenario.pdf.

`printForecastReport.m` - Creates a detailed report of the forecast(s).

- USER must specify `version` and `scenario` of the set of results she wants reported.
- Can report a single scenario, defined by the string passed to `shock`
- If a non-empty string is passed to `control`, then the two scenarios are reported in shock-minus-control fashion.
- Report is stored in Results/|version| folder under GPM_country_forecast_shock.pdf or GPM_country_forecast_shock_vs_control.pdf
- Forecast results augmented with more reporting variables are stored in the same location as GPM_country_forecast_q_shock.csv (and possibly GPM_country_forecast_q_control.csv).
- Forecast results at an annual frequency are stored in the same format with _a replacing _q in the file names.

```
% Single Open Economy Model, Satellite Module to GPM- Iris version
!variables:transition

LGDP, LGDP_BAR, G, Y, GROWTH, GROWTH4, GROWTH_BAR, GROWTH4_BAR
UNR, UNR_GAP, UNR_BAR, UNR_G,
PIE, PIE4, LCPI, E4_PIE4, PIETAR, RS, RR, RR_BAR, E1_Y, LZ, LZ_BAR, LZ_GAP
YF, RR_US, RR_BAR_US, LZ_E, E1_PIE

!parameters

alpha1, alpha2, alpha3, alpha4
beta1, beta2, beta3, beta4, beta5,
gamma1, gamma2, gamma4,
lambda1, lambda2, lambda3,
phi, rho, tau, growth_ss, rr_bar_ss,
rhobar_us, rho_us, betaf, rr_bar_us_ss, unr_ss, pietar_ss

!shocks:transition

RES_LGDP_BAR, RES_Y, RES_G,
RES_UNR_GAP, RES_UNR_BAR, RES_UNR_G,
RES_PIE, RES_PIETAR, RES_RS, RES_RR_BAR, RES_RR_DIFF, RES_LZ_BAR,
RES_RR_BAR_US, RES_RR_US, RES_YF

!equations:transition

 % Host

    Y = LGDP - LGDP_BAR;

 LGDP_BAR = LGDP_BAR{-1} + G/4 + RES_LGDP_BAR;
    GROWTH = 4*(LGDP - LGDP{-1});
    GROWTH4 = LGDP - LGDP{-4};
    GROWTH_BAR = 4*(LGDP_BAR - LGDP_BAR{-1});
    GROWTH4_BAR = LGDP_BAR - LGDP_BAR{-4};

 G = tau*growth_ss + (1-tau)*G{-1} + RES_G;

 Y = beta1*Y{-1} + beta2*Y{+1} - beta3*(RR{-1} - RR_BAR{-1}) + beta4*LZ_GAP{-1} +beta5*YF + RES_Y;

 UNR_GAP = alpha1*UNR_GAP{-1} + alpha2*Y + RES_UNR_GAP;

 UNR =  UNR_BAR - UNR_GAP;

 UNR_BAR = (1-alpha3)*UNR_BAR{-1} + alpha3*unr_ss + UNR_G + RES_UNR_BAR;
    UNR_G = (1 - alpha4)*UNR_G{-1} + RES_UNR_G;

 PIE = lambda1*PIE{+1} + (1-lambda1)*PIE{-1} + lambda2*Y{-1} + lambda3*(LZ-LZ{-1}) +  RES_PIE;

```

```
PIE4 = (PIE + PIE{-1} + PIE{-2} + PIE{-3})/4;

LCPI = LCPI{-1} + PIE/4;

E4_PIE4 = PIE4{+4};

RR = RS - PIE{+1};

   E1_PIE = PIE{+1};

RR_BAR = rho*rr_bar_ss + (1-rho)*RR_BAR{-1} + RES_RR_BAR;

RS = gamma1*RS{-1} + (1-gamma1)*(RR_BAR + E4_PIE4 + gamma2*(PIE4{+3} - PIETAR{+3}) + gamma4*Y) + RES_RS;

E1_Y = Y{+1};

PIETAR = PIETAR{-1} + RES_PIETAR;

LZ_GAP = LZ - LZ_BAR;

LZ_BAR = LZ_BAR{-1} + RES_LZ_BAR;

RR - RR_US = 4*(LZ_E-LZ) + RR_BAR - RR_BAR_US + RES_RR_DIFF;

LZ_E = phi*LZ{+1} + (1-phi)*LZ{-1};

   %Foreign block

   RR_BAR_US = rhobar_us*rr_bar_us_ss + (1-rhobar_us)*RR_BAR_US{-1} + RES_RR_BAR_US;

RR_US = rho_us*rr_bar_us_ss + (1-rho_us)*RR_US{-1} + RES_RR_US;

YF = betaf*YF{-1} + RES_YF;

!variables:measurement

   LGDP_, LCPI_, UNR_, RS_, LZ_, RR_US_,RR_BAR_US_, YF_

!equations:measurement

   LGDP_ = LGDP;
   LCPI_ = LCPI;
   UNR_ = UNR;
   RS_ = RS;
   LZ_ = LZ;
   RR_US_ = RR_US;
RR_BAR_US_ = RR_BAR_US;
YF_=YF;
```

Reading definitions

```
%Define the version name to be used in subsequent reports and data files.
%There are names for the version of the session, usually a date, and for the
%estimation.
version = 'Feb14';
estimVer = 'V0';

%Choose country name- Mnemonics should be 2 letters
country = 'MX';

%Estimation period
startest = qq(2001,4); %beginning
endest  = qq(2010,3); %end

%Smoothing period
startsmooth = qq(2001,4); %beginning
endsmooth  = qq(2010,3); %end // difference between endest and endsmooth?

%Forecasting period;
startfcast = endsmooth+1;
endfcast = startfcast + 40;
```

readModel.m – Read and parameterize the model.

This m-file reads and parses the model code file, and creates a model object in Matlab memory. The model object is then available for us to run the various exercises.

Contents

- Clearing the workspace
- Get definitions
- Baseline parameters
- Read the model code, assign parameters and create a model object
- Solve the model
- Save the model object for future use.

Clearing the workspace

Clearing the workspace at the beginning of each new task is a really good idea.

```
clear all;
close all;
home();
```

Get definitions

```
readDefinitions;
```

Baseline parameters

We create a parameter database (note we use the word 'database' for a Matlab 'struct') and use it then to assign the model's parameters. Alternatively, you could first read the model, and only then create a parameter database, and assign the parameters. Whichever suits you better.

There is a parameter controlling the std deviation of each shock, called `'std_'` and the name of the shock. You needn't declare these in the model code file, they're created automatically, but you can treat them exactly the same way as the other parameters.

Finally, note that the values of parameters set here are immaterial for those parameters that are later estimated in `estimateParams.m`

```
% A new empty database (struct).
P = struct();

% Steady-state parameters.
P.growth_ss     = 3.0;
P.pietar_ss     = 3.0;
```

```
P.rr_bar_ss     = 2.5;
P.rrf_bar_ss = 2.5;
P.rr_bar_us_ss  = 1.9;
P.rho_us        = 0.8;
P.rhobar_us     = 0.9;
P.unr_ss        = 4.0;


% Transitory parameters.
P.alpha1 = 0.8494 ;
P.alpha2 = 0.0607 ;
P.alpha3    =   1   ;
P.alpha4    =   0.5 ;
P.beta1     = 0.500 ;
P.beta2     = 0.2396 ;
P.beta3     = 0.1427 ;
P.beta4     = 0.0500 ;
P.beta5  = 0.1958 ;
P.gamma1 = 0.7043 ;
P.gamma2 = 1.0741 ;
P.gamma4 = 0.1503 ;
P.lambda1 = 0.5791 ;
P.lambda2 = 0.1000 ;
P.lambda3 = 0.0964 ;
P.phi     = 0.8000 ;
P.rho     = 0.0500 ;
P.tau     = 0.0302 ;
P.betaf     =   0.7664;

% Std deviations of shocks
P.std_RES_LGDP_BAR = 0.1005 ;
P.std_RES_Y         = 0.1553 ;
P.std_RES_G         = 0.0166 ;
P.std_RES_UNR_GAP = 0.0484 ;
P.std_RES_UNR_BAR = 0.0092 ;
P.std_RES_PIE       = 0.2295 ;
P.std_RES_RR_BAR = 0.04 ;
P.std_RES_RS        = 0.1219 ;
P.std_RES_PIETAR = 0.0 ;
P.std_RES_RR_DIFF = 0.0737 ;
P.std_RES_LZ_BAR = 1.885;
% For Mexico Model, only US counts
P.std_RES_RR_BAR_US = 0.0 ;
P.std_RES_RR_US       = 0.0 ;
P.std_RES_YF        = 0.0 ;
P.std_RES_UNR_G     = 0.0092 ;
```

Read the model code, assign parameters and create a model object

The `model` function reads the model code file specified as the first input argument, and creates a model

object m in Matlab memory.

- The 'linear'(=true) option indicates that this is a linear model (and some more efficient algorithms can be used).
- The 'assign'(=P) option allows us to assign the model's parameters straight away when creating the model object. Alternatively, the parameters may be assigned after the model object has been created.

```
m = model(...
    sprintf('Models/GPMPlus_%s.model',country),...
    'linear',true,...
    'assign',P);
```

Solve the model

```
m = solve(m);
display(m);
```

```
m =

linear model object: 1 parameterisation(s)
solution(s) available for a total of 1 parameterisation(s)
user data: empty
```

Save the model object for future use.

Saved using the IRIS `savestruct` function.

```
savestruct('model.mat',m);
```

readData.m – Read data from CSV files (located in InputData folder).

Contents

- Clear the workspace
- Define dates and the country of interest.
- Creation of Historical Database
- Construction of Foreign Aggregates
- GPM database
- Create measurement variables.
- Check if there are any measurement variables declared in the model missing from the database
- Save data structure for future use.

Clear the workspace

```
clear('all');
close('all');
home();
```

Define dates and the country of interest.

```
readDefinitions;
```

Creation of Historical Database

Construction of Foreign Aggregates

The trade shares are reported below both in scalar and vector representation. The vector representation is used to calculate the aggregates for foreign output gap YF, real interest rate RRF and equilibrium real interest rate RRF_BAR. These 3 aggregates will enter the model as observables (measurement variables).

```
% Define source of data
cc6={'_US','_EU', '_JA', '_EA6', '_LA6', '_RC6'};
imp_=[0.5590,   0.0856,0.0507,0.1905,0.0300,0.0616];
exp_=[0.8051,0.0474,0.0075,0.0203,0.0281,0.0541];
trade_=(imp_+exp_)/2;

% Load Y, RR and RR_BAR for the 6 blocks from a GPM6 forecast database.
% Proceed to calculate the aggregates.  Use trade shares as weights.
d= dbempty();
db_gpm6=dbload('InputData/GPM6_forecast.csv');
drng=get(db_gpm6.Y_US, 'range');
varlist6={'Y'};
```

```
varlistf={'YF'};
for i = 1 : numel(varlist6)
    ts = tseries(drng, 0);   %creates empty tseries
    for j = 1 : numel(cc6)
        varname=strcat(varlist6(i), cc6(j));    %creates Y_US, Y_EU, etc.
        ts = ts + trade_(j)*db_gpm6.(varname{1});   %adds aggregates of Y to tseries.
    end
    d.(varlistf{i})=ts;
end
```

GPM database

Create a subset of data for the model and save it in InputData/ for future reference

```
db=dbload('InputData/GPMdata.csv');
cc=sprintf('_%s',country);
varlist={'LGDP', 'LCPI', 'UNR', 'LS', 'LCPIX'};
for i = 1 : numel(varlist)
   varname=strcat(varlist(i), cc);
   d.(varlist{i})=db.(varname{1});
end
d.LZ=d.LS+db_gpm6.LCPI_US-d.LCPI;
d.LCPI_US = db_gpm6.LCPI_US;
% Mexico model includes RR_US and RR_BAR_US as observables
d.RR_US = db_gpm6.RR_US;
d.RR_BAR_US = db_gpm6.RR_BAR_US;

db_mx=dbload('InputData/MX_RS.csv');
d.RS = db_mx.RS_MX; % Definition of nominal interest rates to be used in the model

dbsave(d,['GPM' cc '.csv'],Inf,'class',false,'comment',false,'format','%.8f');
movefile(['GPM' cc '.csv'],'InputData/');
```

Create measurement variables.

```
D = struct();

D.LGDP_ = d.LGDP;
D.LCPI_ = d.LCPI;
D.UNR_ = d.UNR;
D.RS_ = d.RS;
D.LZ_ = d.LZ;
D.YF_ = d.YF;
D.LCPI_US = d.LCPI_US;
D.RR_US_ = d.RR_US;
D.RR_BAR_US_ = d.RR_BAR_US;
```

Check if there are any measurement variables declared in the model missing from the database

```
m = loadstruct('model.mat');
ylist = get(m,'ylist');
list = fieldnames(D);
missing = ylist - list;
if isempty(missing)
   disp('All measurement variables available.');
else
   disp('Measurement variables missing from the database:');
   disp(missing);
end
```

```
All measurement variables available.
```

Save data structure for future use.

```
savestruct('data.mat',D);
```

estimateParams.m – Estimate parameters using maximum regularised likelihood.

Contents

- Clearing the workspace
- Load data and model
- Prior database.
- Estimate model.
- Behaviour of the likelihood function in the neighbourhood of the optimum
- Run Kalman smoother and projections.
- Compute historical contributions of shocks
- Save results for future use.

Clearing the workspace

```
clear all;
close all;
home();
warning off;

readDefinitions;
```

Load data and model

```
d = loadstruct('data.mat');  % data.mat contains observable variables
m = loadstruct('model.mat');

mstar = m;
display(mstar);
```

```
mstar =

linear model object: 1 parameterisation(s)
solution(s) available for a total of 1 parameterisation(s)
user data: empty
```

Prior database.

The prior for each parameter is a truncated normal distribution. Each parameter is assigned four numbers:

[prior mode, lower bound, upper bound, 1/(prior std dev before penalty)^2]

```
E = struct();

E.alpha1        = [0.65 , 0.01, 1, 1/0.05^2];
E.alpha2        = [0.05 , 0.01, 2, 1/0.08^2];
E.alpha3        = [0.2 , 0.01, 1, 1/0.05^2];
E.alpha4        = [0.5 , 0.01, 2, 1/0.1^2];
E.beta1         = [0.50 ,0.01, 1, 1/0.1^2];
E.beta2         = [0.25 ,0.01, 1, 1/0.05^2 ];
E.beta3         = [0.15 ,0.01, 1, 1/0.07^2 ];
E.beta4         = [0.05 , 0.01, 0.5, 1/0.003^2];
E.beta5         = [0.2 , 0.01, 0.5, 1/0.05^2];
E.gamma1        = [0.70 , 0.01, 1, 1/0.05^2];
E.gamma2        = [1.05 , 0.01, 5, 1/0.2^2];
E.gamma4        = [0.15 , 0.01, 2, 1/0.05^2];
E.lambda1       = [0.55 , 0.01, 1, 1/0.08^2];
E.lambda2       = [0.10 , 0.01, 2, 1/0.10^2];
E.lambda3       = [0.10 , 0.01, 2, 1/0.05^2];
E.phi           = [0.80 , 0.01, 1, 1/0.2^2];
E.rho           = [0.05 , 0.01, 1, 1/0.02^2];
E.tau           = [0.03 , 0.01, 2, 1/0.02^2];
E.betaf         = [0.75 , 0.01, 1, 1/0.1^2];

E.std_RES_LGDP_BAR = [0.10, 0.01, 2, 1/0.002^2 ];
E.std_RES_Y        = [0.40, 0.01, 2, 1/0.2^2 ];
E.std_RES_G        = [0.05, 0.01, 2, 1/0.003^2 ];
E.std_RES_UNR_GAP  = [0.60, 0.01, 2, 1/0.2^2 ];
E.std_RES_UNR_BAR  = [0.50, 0.01, 2, 1/0.2^2 ];
E.std_RES_UNR_G    = [0.50, 0.01, 2, 1/0.2^2 ];
E.std_RES_PIE      = [1.00, 0.01, 2, 1/0.2^2 ];
E.std_RES_RR_BAR   = [0.30, 0.01, 2, 1/0.02^2 ];
E.std_RES_RS       = [0.20, 0.01, 2, 1/0.2^2 ];
E.std_RES_PIETAR   = [0.10, 0.01, 2, 1/0.2^2 ];
E.std_RES_RR_DIFF  = [2.00, 0.01, 3, 1/0.2^2 ];
E.std_RES_LZ_BAR   = [2.00, 0.01, 3, 1/0.2^2 ];
E.std_RES_YF       = [0.40, 0.01, 2, 1/0.2^2 ];
E.std_RES_RR_BAR_US  = [0.30, 0.01, 2, 1/0.02^2 ];
E.std_RES_RR_US      = [0.25, 0.01, 2, 1/0.2^2 ];
```

Estimate model.

The `estimate` function uses the so-called maximum regularized likelihood Bayesian estimation method (in which the priors are truncated normal distributions) to calculate estimates of the model parameters.

The output arguments of the `estimate` function are

- `Estar`, database with point estimates of model parameters
- `obj`, value of objective function (minus log-likelihood or weighted sum of prediction errors)
- `Grad`, Gradient at optimum,
- `Hess`, Hessian of log-posterior, and Hessian of log-prior (or penalty function) at optimum,
- `mstar`, a model object with parameter estimates updated

The input arguments of the `estimate` function are

- `m`, a model object to be estimated
- `d`, a database with measurement variables
- `starthist:endhist`, date range for estimation
- `E`, prior database
- `penalty`, a scalar that governs the overall tightness of the priors on the parameters (0 = maximum likelihood)

```
penalty = 0.1;
[Estar,obj,Grad,Hess,mstar] =...
    estimate(m,d,startest:endest,E,...
    'penalty',penalty,'tolx',1e-5,'tolfun',1e-5,'MaxFunEvals',5000,'nosolution','penalty');


disp('Value of the likelihood function at the optimum')
disp(obj()); % You must use the empty round brackets to get the value.
disp('Maximum likelihood estimates');
disp(get(mstar,'parameters'));
```

```
                                Max     Line search  Directional  First-order
Iter F-count        f(x)   constraint   steplength   derivative   optimality Procedure
   0     35      613.823        -0.02
   1     82      613.792     -0.02032     0.000244         -212          787
   2    125      611.434     -0.02802      0.00391         -225    1.41e+003
   3    166      605.975     -0.02758       0.0156         -192    1.22e+003
   4    205      587.079     -0.02586       0.0625         -231    2.33e+003
   5    246      582.475     -0.02545       0.0156        -99.1          870
   6    285      580.101     -0.02386       0.0625         -101    1.96e+003
   7    326      578.928     -0.02349       0.0156        -93.5    1.83e+003
   8    365      577.411     -0.02202       0.0625         -118          965
   9    405      575.883     -0.02133       0.0313        -43.4    1.36e+003
  10    445      574.066     -0.02067       0.0313        -49.4    1.89e+003
  11    486       573.02     -0.02034       0.0156          -74    1.45e+003
  12    525      571.212     -0.01907       0.0625         -109    1.46e+003
  13    565      569.159     -0.01848       0.0313        -56.1          857
  14    605       567.67     -0.03215       0.0313        -66.3    1.72e+003
  15    645      564.737     -0.03115       0.0313          -82          445
  16    685      563.449     -0.03017       0.0313        -33.8          625
  17    726      562.974      -0.0297       0.0156        -22.1          634
  18    766      561.758     -0.02877       0.0313        -31.9          409
  19    807      561.352     -0.02832       0.0156        -30.5          256
  20    847      560.497     -0.02744       0.0313        -25.9          168
  21    887      560.129     -0.02658       0.0313        -18.5          123
  22    926       560.09     -0.02492       0.0625        -21.6          143
  23    966      559.884     -0.02414       0.0313        -18.6          221
  24   1007      559.771     -0.02376       0.0156        -13.4         92.5
  25   1048       559.65     -0.02339       0.0156        -9.96         73.7
```

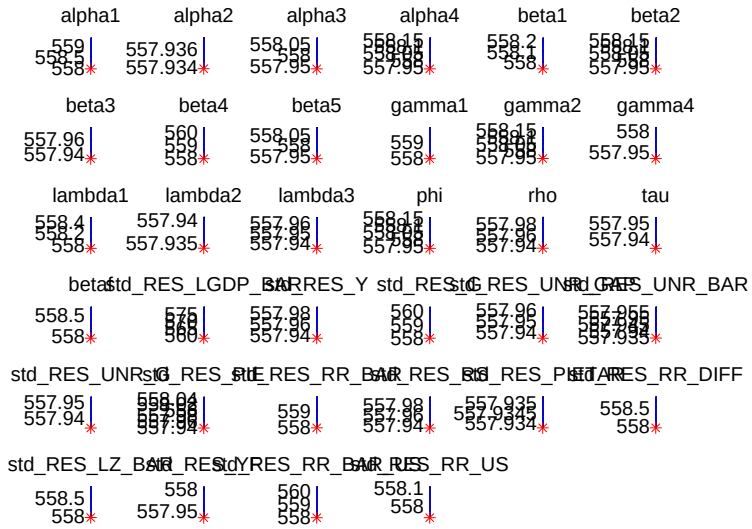
```
   26   1089      559.478     -0.02303       0.0156        -13.4           66
   27   1130      559.114     -0.02413       0.0156        -26.6         78.6
   28   1171      558.895     -0.02375       0.0156        -15.9          140
   29   1212      558.877     -0.02338       0.0156        -11.1          126
   30   1252      558.649     -0.02265       0.0313        -13.5          142
   31   1292      558.597     -0.02194       0.0313        -12.8          165
   32   1333      558.537      -0.0216       0.0156        -11.4          234
   33   1373      558.483     -0.02093       0.0313        -6.22          219
   34   1412       558.22     -0.01962       0.0625        -13.2          159
   35   1453      558.162     -0.02197       0.0156        -14.4         74.9
   36   1494      558.139     -0.02163       0.0156        -4.66         24.7
   37   1535      558.128     -0.02129       0.0156        -3.19         69.2
   38   1575      558.119     -0.02063       0.0313        -3.34           81
   39   1614      558.076     -0.02141       0.0625        -4.21         86.6
   40   1654      558.059     -0.02074       0.0313        -5.63         47.6
   41   1694      558.052     -0.02009       0.0313        -2.44         25.4
   42   1734      557.958     -0.01946       0.0313        -11.7         50.5
   43   1775      557.956     -0.01963       0.0156        -1.23         44.7
   44   1816      557.955     -0.01959       0.0156        -0.84         42.8
   45   1855       557.94     -0.01981       0.0625        -2.72         35.6
   46   1890      557.934      -0.0197            1        -1.78         3.93
   47   1925      557.934      -0.0197            1       -0.408        0.313
   48   1960      557.934     -0.01971            1       -0.135        0.168  Hessian modified

Local minimum possible. Constraints satisfied.

fmincon stopped because the predicted change in the objective function
is less than the selected value of the function tolerance and constraints
were satisfied to within the default value of the constraint tolerance.



No active inequalities.
Value of the likelihood function at the optimum
  557.9337

Maximum likelihood estimates
               alpha1: 0.6515
               alpha2: 0.0507
               alpha3: 0.2023
               alpha4: 0.5084
                beta1: 0.5149
                beta2: 0.2547
                beta3: 0.1494
                beta4: 0.0500
                beta5: 0.2068
              gamma1: 0.7150
              gamma2: 1.0350
              gamma4: 0.1460
             lambda1: 0.6166
```

```
          lambda2: 0.0528
          lambda3: 0.0902
              phi: 0.6966
              rho: 0.0516
              tau: 0.0297
       growth_ss: 3
       rr_bar_ss: 2.5000
       rhobar_us: 0.9000
          rho_us: 0.8000
           betaf: 0.7943
    rr_bar_us_ss: 1.9000
          unr_ss: 4
       pietar_ss: 3
std_RES_LGDP_BAR: 0.3700
       std_RES_Y: 1.1011
       std_RES_G: 0.1851
 std_RES_UNR_GAP: 1.3018
 std_RES_UNR_BAR: 1.1109
   std_RES_UNR_G: 1.0289
     std_RES_PIE: 2.8931
  std_RES_PIETAR: 0.2812
      std_RES_RS: 0.7740
  std_RES_RR_BAR: 1.1074
 std_RES_RR_DIFF: 7.3369
  std_RES_LZ_BAR: 7.3376
std_RES_RR_BAR_US: 1.1618
    std_RES_RR_US: 1.6265
       std_RES_YF: 0.7187
```

Behaviour of the likelihood function in the neighbourhood of the optimum

The `neighbourhood` function evaluates the objective function (accessible thanks to the `obj` handle) for a few values of each parameter around the optimum. In this case, each parameter estimate will investigate within the range of +/- 5 % of the estimated value (= 0.95 : 0.01 : 1.05 times the value of the estimate).

```
[chkPlots,h] = neighbourhood(mstar,obj,0.95:0.01:1.05,'plot',true);
chk.d = chkPlots;
chk.pstar = obj([],'pstar');
chk.obj = obj();
```



Run Kalman smoother and projections.

A Kalman smoother yields the estimates of the unobservables based on the whole sample.

The output arguments of the `filter` function are

- `m1`, a model object with estimates of the unobservables
- `smooth`, a struct with `mean` and `std` databases containing the results of the Kalman smoother
- `se2`, the estimate of the overall variance scaling factor (when the `'relative'` option is set to true, which is by default)
- `pe`, a database with prediction errors for the measurement variables

The input arguments of the `filter` function are

- `mstar`, a model object to be filtered
- `d`, a database with measurement variables
- `starthist:endproj`, date range for filtration
- `'ahead'`,(=12), maximum number of steps ahead for which predictions of measurement variables are calculated

```
[m1,smooth,se2,delta,pe] = filter(mstar,d,startsmooth:endsmooth,'ahead',12);
f = smooth.mean;
f.std = smooth.std;
```

Compute historical contributions of shocks

Running a `simulate` function on the Kalman smoother results would simply reproduce the in-sample observations.

The `'contributions'` option of the `simulate` function allows us to break the historical paths of all transition and measurement variable down to the contributions of the individual shocks and the initial condition. The output database contains time series with n+1 columns, where n is the number of shocks. The first n columns are the contributions of the shock, the last column is the effect of the initial condition and the constant.

```
s = simulate(mstar,f,startsmooth:endsmooth,'anticipate',false,'contributions',true);
```

Save results for future use.

```
thisdir = sprintf('Results/%s/',version);
if ~exist(thisdir,'dir')
    mkdir(thisdir)
end

thismat = sprintf('estimation_%s.mat', estimVer);
save(thismat,'d','mstar','m','chk','Estar','E','Hess','penalty','f','pe','s');
movefile(thismat,thisdir);
```

printEstimationReport.m – creates a detailed report of the estimation and smoothing results

Contents

- Clear workspace.
- Version to report. BE SURE TO MAKE CHANGES TO VERSION DESCRIPTION !!!
- Load necessary input
- Define syles, create output directories
- Create report of model code listing.
- Create and include a historical plot of observables
- Create and include table with estimated parameter values.
- Create and include check plots.
- Create and include table with calibrated parameter values.
- Include IRFs.
- Include RMSEs.
- Add smoother report.
- Add economic activity gaps graph.
- Add output gap graph.
- Add YoY potential growth graph.
- Create historical shock decomposition report
- Add Kalman prediction plots
- Compile PDF.

Clear workspace.

```
clear('all');
close('all');
home();

readDefinitions;
```

Version to report. BE SURE TO MAKE CHANGES TO VERSION DESCRIPTION !!!

Each time you run `estimateParams`, the results are saved under a new version name. To access and report the correct results, you need to change the following line accordingly.

```
fprintf('%s...\n',country);
fprintf('Version to report: %s.\n',version);
```

```
MX...
Version to report: Feb14.
```

Load necessary input

```
thisfile = sprintf('Results/%s/estimation_%s.mat',version,estimVer);
load(thisfile,'d','mstar','chk','Estar','E','Hess','penalty','f','pe','s');
```

Define syles, create output directories

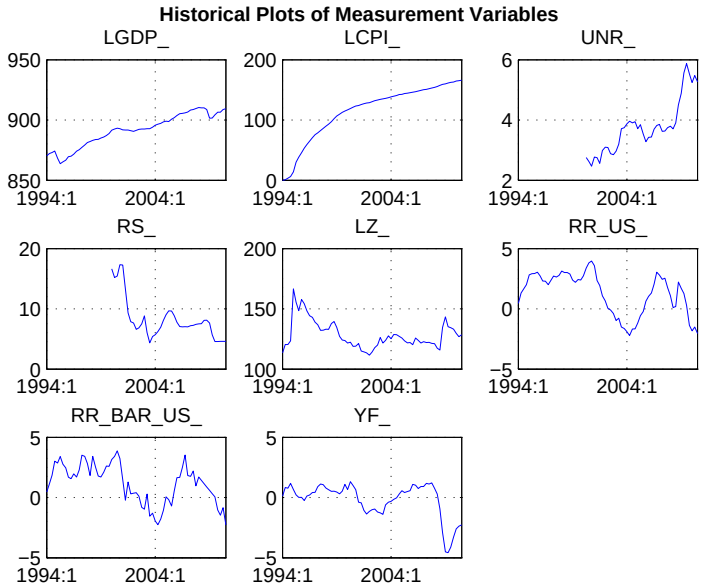
```
dirs = {'ReportFiles'};
for i = 1 : numel(dirs)
    if exist(sprintf('Results/%s/%s',version,dirs{i}),'dir') ~= 7
        mkdir(sprintf('Results/%s/%s',version,dirs{i}));
    end
end

cwd = pwd;
eval(sprintf('cd Results/%s/ReportFiles',version));

gray = 0.3*[1,1,1];
generalstyle = struct();
generalstyle.axes.xgrid = 'on';
generalstyle.axes.ygrid = 'on';
generalstyle.line.lineWidth = 2.5;
generalstyle.line.color = {gray,'blue','red','green'};
generalstyle.line.lineStyle = {'-','-','-','-'};
generalstyle.patch.faceColor = [0.85,0.85,1];
generalstyle.patch.edgeColor = 'none';
generalstyle.bar.faceColor = 0.6*[1,1,1];
generalstyle.bar.edgeColor = 'none';
generalstyle.bar.barWidth = 1;
```

Create report of model code listing.

```
x = report.new();
x.include('The Model',sprintf('%s/Models/GPMPlus_%s.model',cwd,country),'verbatim',true)
x.clearpage();
```

Create and include a historical plot of observables

```
createHistPlot(mstar,d,qq(1994,1):endest);
x.include('','histPlot.tex');
```

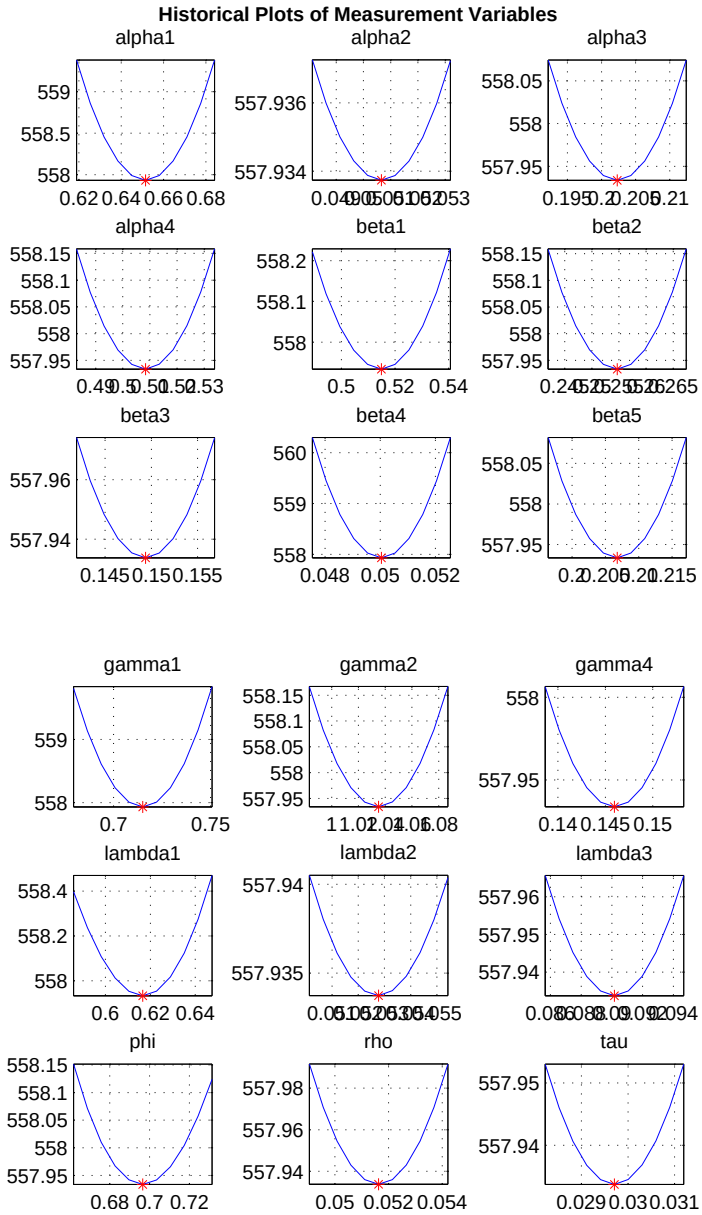


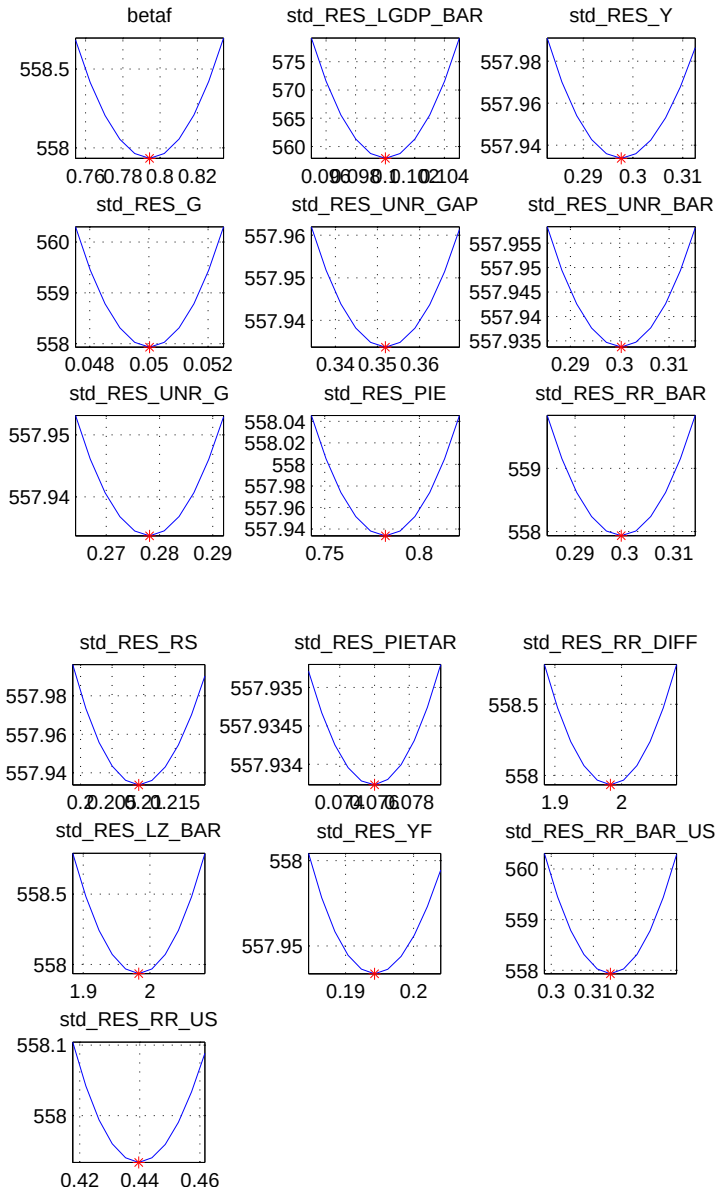
Create and include table with estimated parameter values.

```
62: createEstimTable(Hess,E,mstar,penalty);
63: x.include('Regularized Maximum Likelihood','estimTable.tex');
64: x.clearpage();
```

Create and include check plots.

```
67: createCheckPlots(chk);
68: x.include('','checkPlots.tex');
69: x.clearpage();
```


Historical Plots of Measurement Variables
alpha1
alpha2
alpha3
alpha4
beta1
beta2
beta3
beta4
beta5
gamma1
gamma2
gamma4
lambda1
lambda2
lambda3
phi
rho
tau



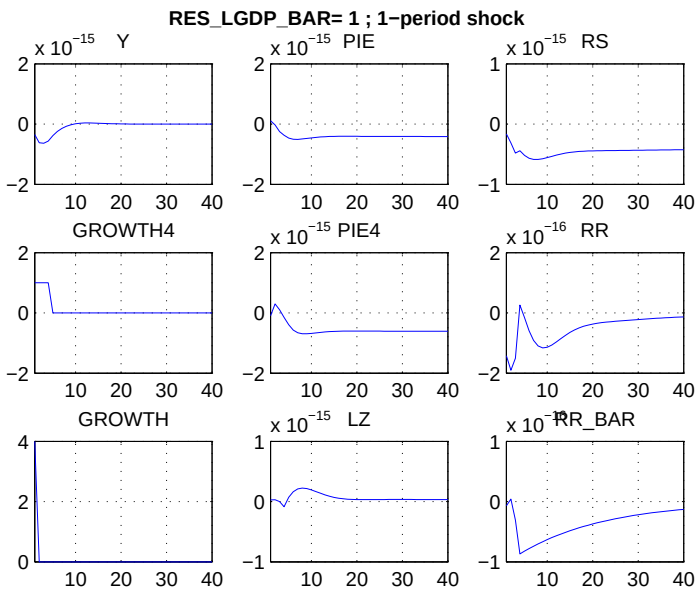
Create and include table with calibrated parameter values.

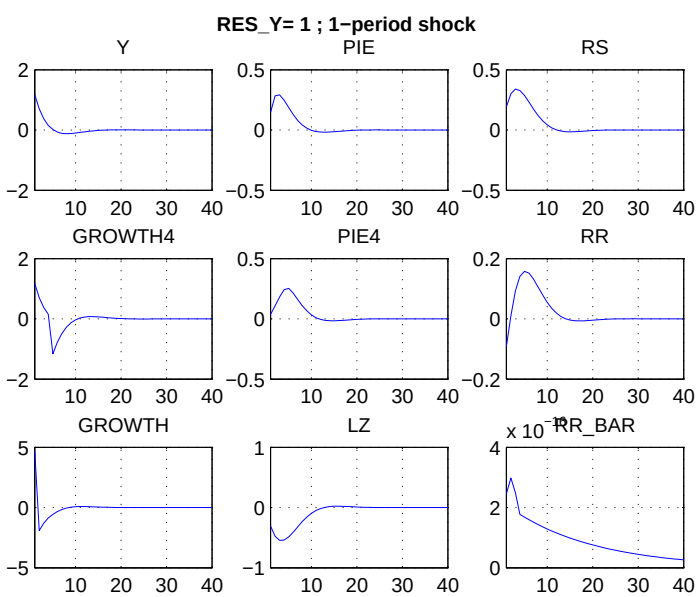
```
72: createCalibTable(mstar, Estar);
73: x.include('Calibrated Parameters','calibTable.tex');
74: x.clearpage();
```

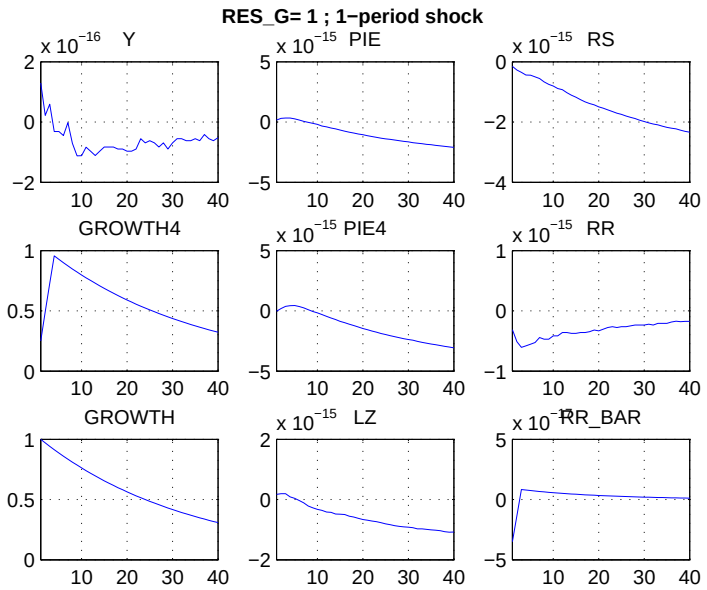
Include IRFs.

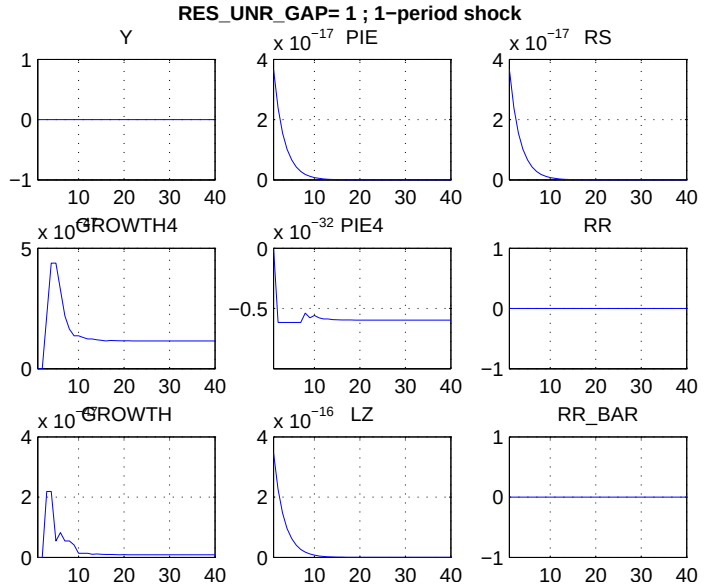
List of variables to plot impulses

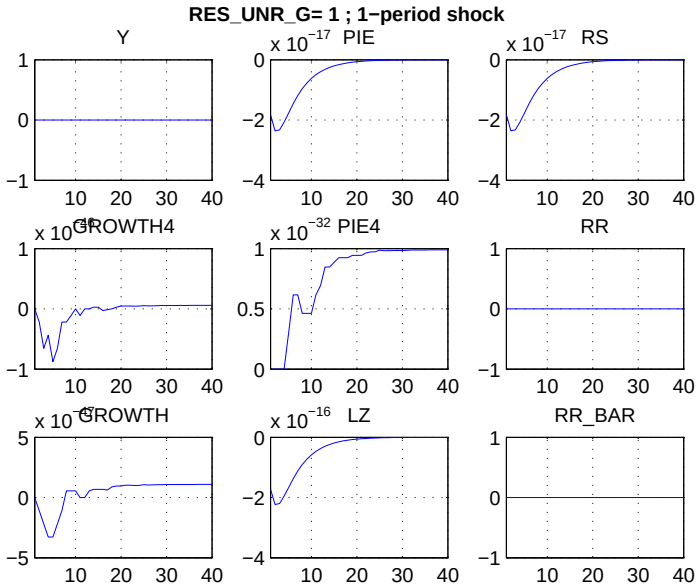
```
list = {'Y', 'PIE', 'RS', 'GROWTH4', 'PIE4', 'RR', 'GROWTH', 'LZ', 'RR_BAR'};
numper = 40;
runIRF(mstar,Estar,list,numper);
x.include('','irfs.tex');
```

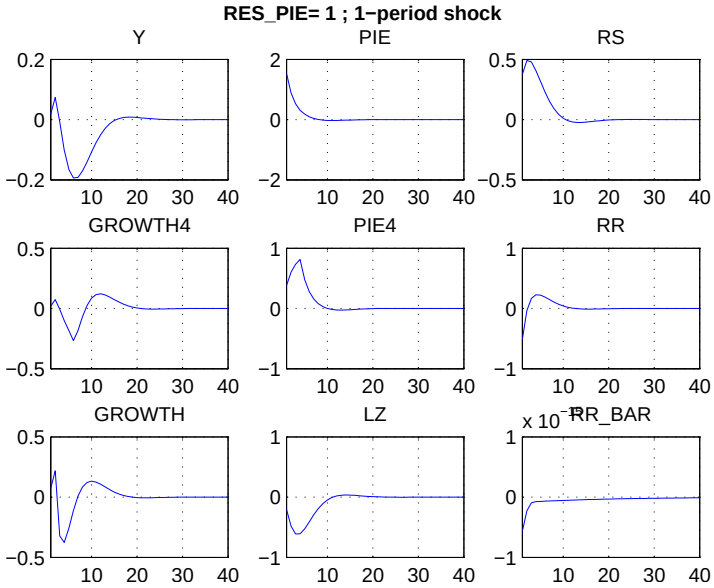


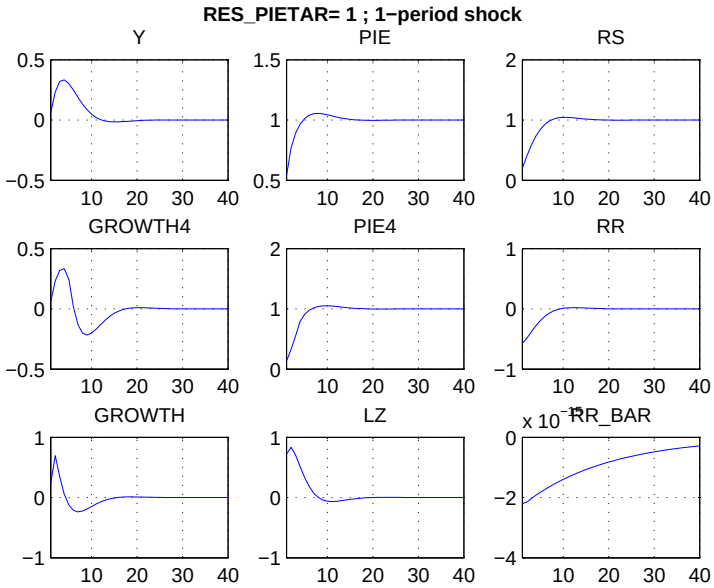


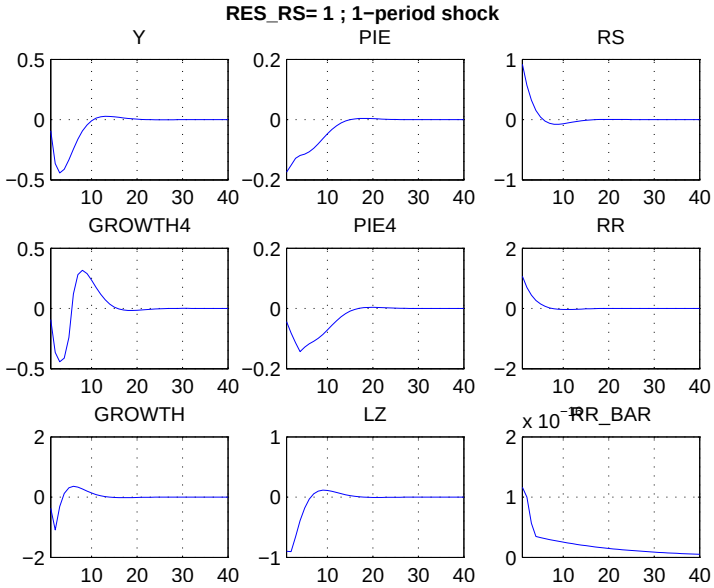

RES_G= 1 ; 1−period shock
x 10−16 Y
x 10−15 PIE
x 10−15 RS
GROWTH4
x 10−15 PIE4
x 10−15 RR
GROWTH
x 10−15 LZ
x 10−15 RR_BAR

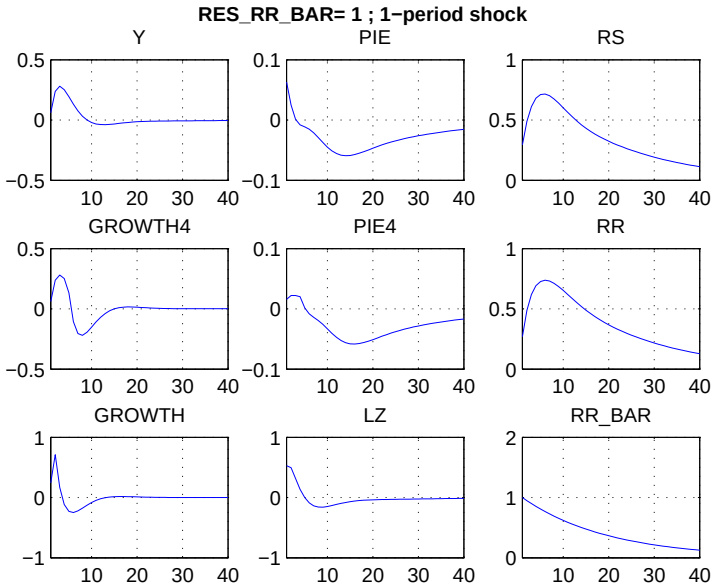

RES_UNR_GAP= 1 ; 1−period shock
Y
x 10−17 PIE
x 10−17 RS
x 10−37 GROWTH4
x 10−32 PIE4
RR
x 10−37 GROWTH
x 10−16 LZ
RR_BAR

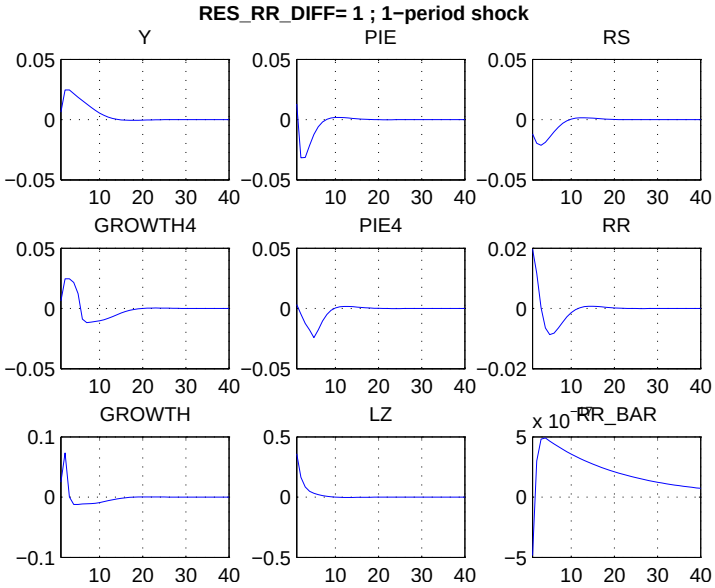

RES_UNR_G= 1 ; 1−period shock
Y
PIE
RS
GROWTH4
PIE4
RR
GROWTH
LZ
RR_BAR

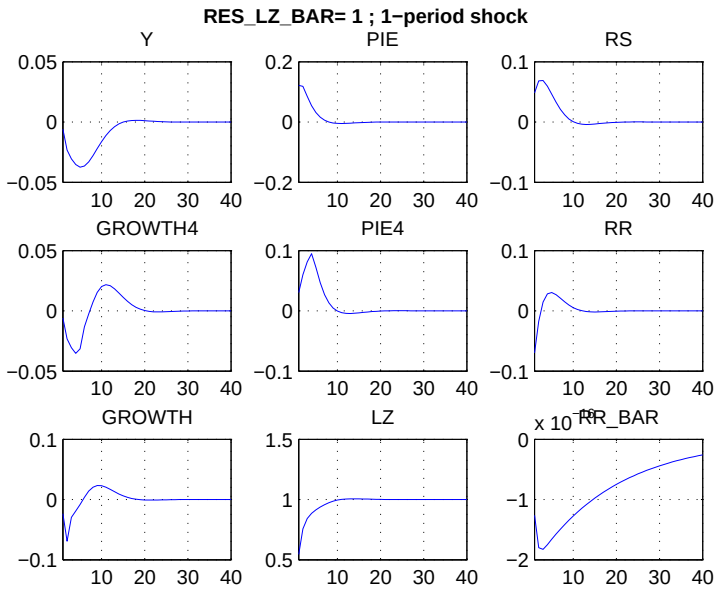

RES_PIE= 1 ; 1−period shock
Y
PIE
RS
GROWTH4
PIE4
RR
GROWTH
LZ
RR_BAR

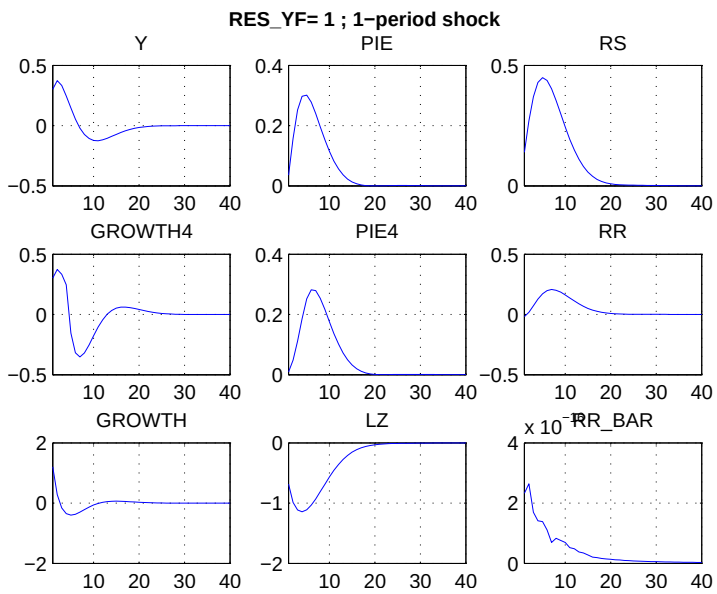

RES_PIETAR= 1 ; 1−period shock
Y
PIE
RS
GROWTH4
PIE4
RR
GROWTH
LZ
x 10^−15
RR_BAR


RES_RS= 1 ; 1−period shock
Y
PIE
RS
GROWTH4
PIE4
RR
GROWTH
LZ
x 10^−15
RR_BAR


RES_RR_BAR= 1 ; 1−period shock
Y
PIE
RS
GROWTH4
PIE4
RR
GROWTH
LZ
RR_BAR


RES_RR_DIFF= 1 ; 1−period shock
Y
PIE
RS
GROWTH4
PIE4
RR
GROWTH
LZ
RR_BAR





Include RMSEs.

```
vlist = {'GROWTH','GROWTH4','RS','PIE','PIE4'};
createRMSETable(mstar,d,startsmooth:endsmooth,vlist,8);
x.include('RMSEs','RMSETable');
```

Add smoother report.

```
GPMPlus_smoother_report(mstar, f, country);
x.include('','smoother.tex');
```

```
starthist = startsmooth;
endhist = endsmooth;
endproj = endsmooth;
```

Add economic activity gaps graph.

```
thisstyle = generalstyle;
thisstyle.line.color = {'blue',[0,0.5,0],'red'};
thisstyle.line.lineStyle = '-';

x.figure('Mexico: Economic activity gaps',...
    'range',starthist:endproj,'saveas',sprintf('%sGraphEconomicActivityGaps%s',country,version));

x.graph('','legend',true,'zeroline',true,'style',thisstyle,'highlight',endhist+1:endproj);
x.series('Inflation',f.PIE4,'plotfunc',@bar);
x.series('Output gap',f.Y);
x.series('Unemployment gap',f.UNR_GAP);

x.clearpage();
```

Add output gap graph.

```
x.figure('Output Gap +/- 2 std devs (w/o model or parameter uncertainty)',...
    'range',starthist:endproj,'saveas',sprintf('%sGraphOutputGap%s',country,version));

x.graph('','legend',true,'highlight',endhist+1:endproj,'zeroline',true,'style',generalstyle);
x.series('Inflation',f.PIE4);
x.band('Output gap',f.Y,-2*f.std.Y,2*f.std.Y);

x.clearpage();
```

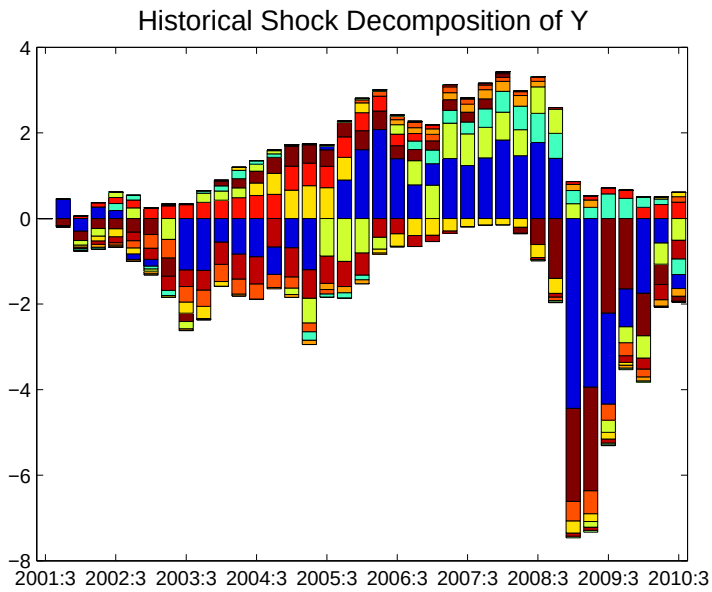
Add YoY potential growth graph.

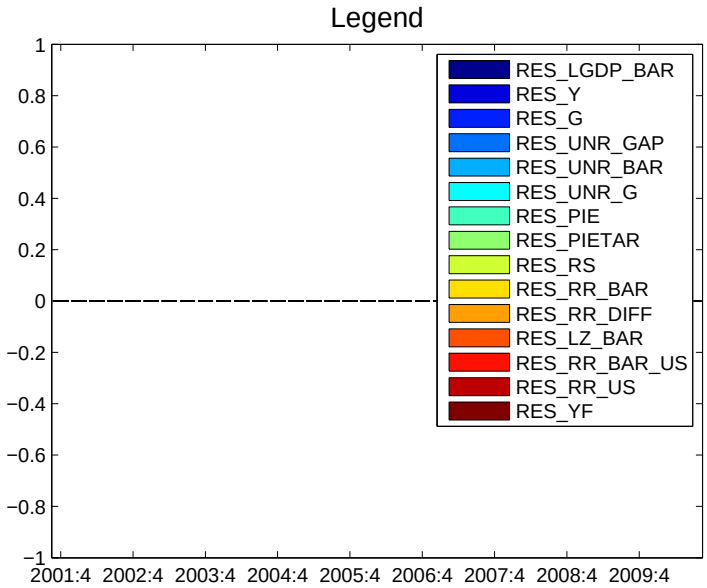
```
x.figure('Output Growth (Y/Y) +/- 2 std devs (w/o model or parameter uncertainty)',...
    'range',starthist:endproj,'saveas',sprintf('%sGraphPotentialGrowthYoY%s',country,version));

```

```
x.graph('','legend',true,'style',generalstyle,'highlight',endhist+1:endproj);
x.series('Actual',f.GROWTH4);
x.band('Potential +/- 2 std devs',f.GROWTH4_BAR,-2*f.std.GROWTH4_BAR,2*f.std.GROWTH4_BAR);
x.clearpage();
```

Create historical shock decomposition report

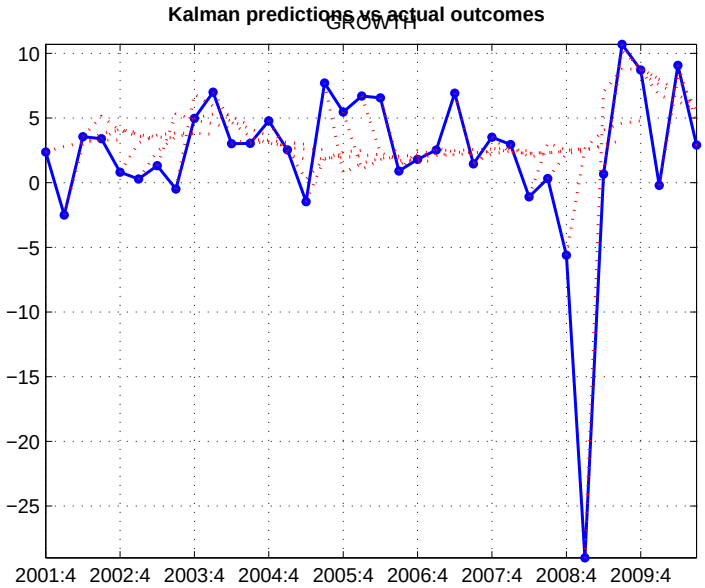
```
vlist = {'Y'};
createShockDecomp(mstar,vlist,s);
x.include('','shockDecomp.tex')
x.clearpage();
```

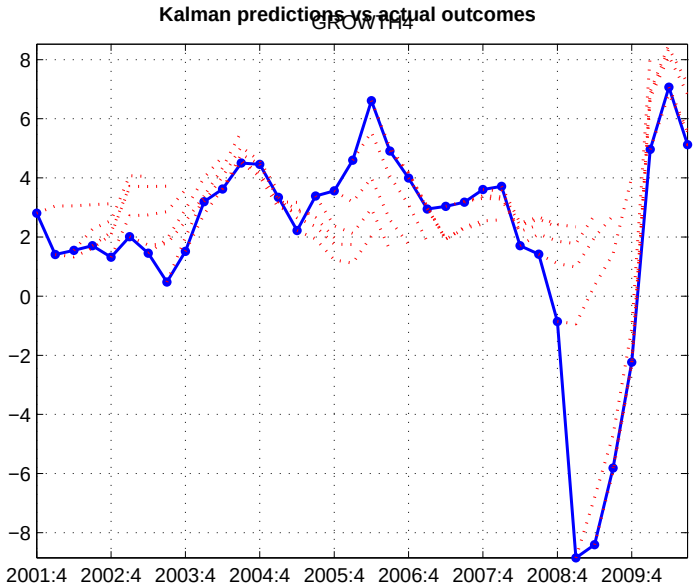


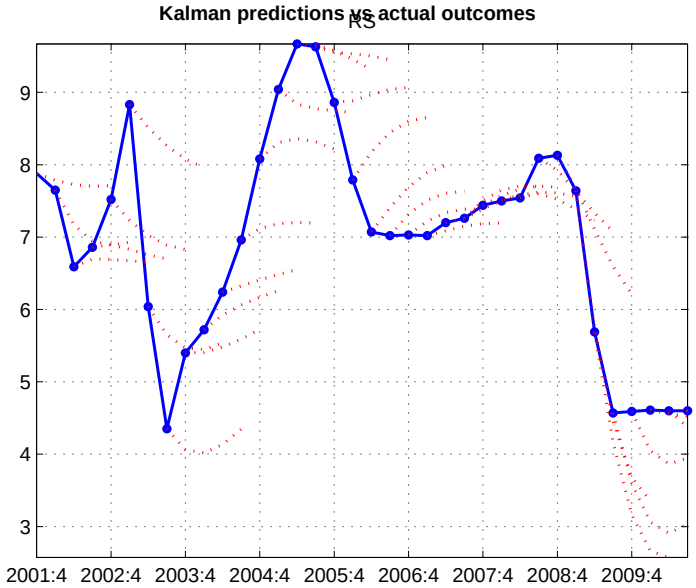


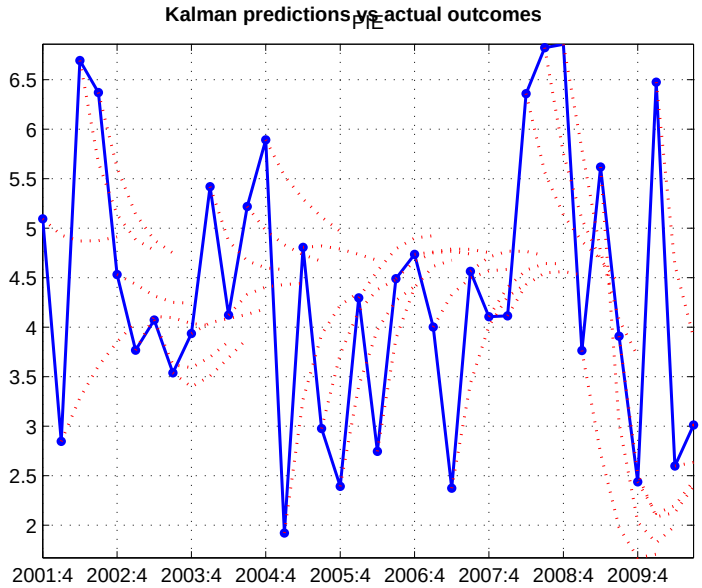
Add Kalman prediction plots

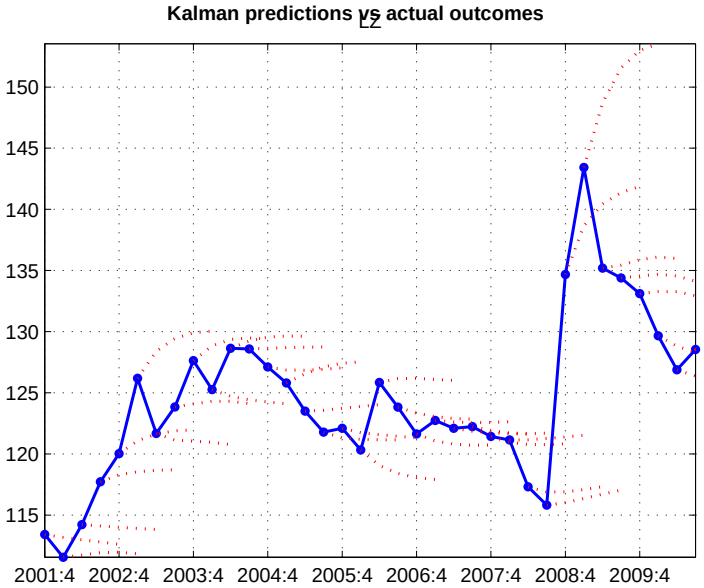
```
148: vlist = {'GROWTH','GROWTH4','RS','PIE','LZ'};
149: createPredPlot(mstar,d,startsmooth:endsmooth,vlist,4);
150: x.include('','predPlot.tex');
151: x.clearpage();
```




Kalman predictions vs actual outcomes
GROWTH4
8
6
4
2
0
−2
−4
−6
−8
2001:4
2002:4
2003:4
2004:4
2005:4
2006:4
2007:4
2008:4
2009:4


Kalman predictions vs actual outcomes
RS
9
8
7
6
5
4
3
2001:4
2002:4
2003:4
2004:4
2005:4
2006:4
2007:4
2008:4
2009:4





Compile PDF.

```
thisfile = sprintf('GPM_%s_EstimationReport_%s.pdf',country,estimVer);
x.publish(thisfile,...
    'title',sprintf('GPM-%s Report: Version %s %s',country,version,estimVer),...
    'maketitle',true,...
```

```
    'deletelatex',false);

copyfile(thisfile,sprintf('%s/Results/%s/',cwd,version));
eval(sprintf('cd %s',cwd));

close all;
```

```
This is pdfTeX, Version 3.141592-1.40.7 (MiKTeX 2.7)
entering extended mode
(tp9a88e936_b8db_455c_9b2b_fc12986a11e8.tex
LaTeX2e <2005/12/01>
Babel <v3.8j> and hyphenation patterns for english, dumylang, nohyphenation, ge
rman, ngerman, french, loaded.
(D:\apps\MiKTeX_2_7\tex\latex\base\article.cls
Document Class: article 2005/09/16 v1.4f Standard LaTeX document class
(D:\apps\MiKTeX_2_7\tex\latex\base\size10.clo))
(D:\apps\MiKTeX_2_7\tex\latex\psnfss\mathptmx.sty)
(D:\apps\MiKTeX_2_7\tex\latex\graphics\graphicx.sty
(D:\apps\MiKTeX_2_7\tex\latex\graphics\keyval.sty)
(D:\apps\MiKTeX_2_7\tex\latex\graphics\graphics.sty
(D:\apps\MiKTeX_2_7\tex\latex\graphics\trig.sty)
(D:\apps\MiKTeX_2_7\tex\latex\00miktex\graphics.cfg)
(D:\apps\MiKTeX_2_7\tex\latex\graphics\pdftex.def)))
(D:\apps\MiKTeX_2_7\tex\latex\sectsty\sectsty.sty)
(D:\apps\MiKTeX_2_7\tex\latex\graphics\color.sty
(D:\apps\MiKTeX_2_7\tex\latex\00miktex\color.cfg))
(D:\apps\MiKTeX_2_7\tex\latex\rotating\rotating.sty
(D:\apps\MiKTeX_2_7\tex\latex\base\ifthen.sty))
(D:\apps\MiKTeX_2_7\tex\latex\geometry\geometry.sty
(D:\apps\MiKTeX_2_7\tex\latex\geometry\geometry.cfg))
No file tp9a88e936_b8db_455c_9b2b_fc12986a11e8.aux.
(D:\apps\MiKTeX_2_7\tex\latex\psnfss\ot1ptm.fd)
(D:\apps\MiKTeX_2_7\tex\context\base\supp-pdf.tex
[Loading MPS to PDF converter (version 2006.09.02).]
) (D:\apps\MiKTeX_2_7\tex\latex\psnfss\ot1ztmcm.fd)
(D:\apps\MiKTeX_2_7\tex\latex\psnfss\omlztmcm.fd)
(D:\apps\MiKTeX_2_7\tex\latex\psnfss\omsztmcm.fd)
(D:\apps\MiKTeX_2_7\tex\latex\psnfss\omxztmcm.fd) [1{C:/ProgramData/MiKTeX/2.7/
pdftex/config/pdftex.map}] [2] [3] [4] (histPlot.tex
<histPlot.pdf, id=18, 794.97pt x 614.295pt> <use histPlot.pdf>) (estimTable.tex
 [5 <histPlot.pdf, page is rotated 90 degrees>]) [6] [7] (checkPlots.tex
<CheckPlots1.pdf, id=36, 794.97pt x 614.295pt> <use CheckPlots1.pdf> [8 <CheckP
lots1.pdf, page is rotated 90 degrees>]
<CheckPlots2.pdf, id=45, 794.97pt x 614.295pt> <use CheckPlots2.pdf> [9 <CheckP
lots2.pdf, page is rotated 90 degrees>]
<CheckPlots3.pdf, id=53, 794.97pt x 614.295pt> <use CheckPlots3.pdf> [10 <Check
Plots3.pdf, page is rotated 90 degrees>]
<CheckPlots4.pdf, id=61, 794.97pt x 614.295pt> <use CheckPlots4.pdf> [11 <Check
Plots4.pdf, page is rotated 90 degrees>]) (calibTable.tex) [12] (irfs.tex
```

```
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bytes).
Transcript written on tp9a88e936_b8db_455c_9b2b_fc12986a11e8.log.
```

Contents

- conditionalForecast.m – runs conditional forecast
- Name scenario.
- Load model and initial condition.
- Set up plan.
- Run forecast.
- Save forecast for future use.

conditionalForecast.m – runs conditional forecast

```
clear all;
close all;
home();

readDefinitions;
```

Name scenario.

```
scenario = 'f1';
```

Load model and initial condition.

```
thisfile = sprintf('Results/%s/estimation_%s.mat',version, estimVer);
load(thisfile,'mstar','f','d');
```

Set up plan.

```
frng = startfcast:endfcast;
p = plan(mstar,frng);

% Tune foreign variables to GPM6 projection over entire forecasting horizon
p = exogenize(p,'YF, RR_US, RR_BAR_US',frng);
p = endogenize(p,'RES_YF, RES_RR_US, RES_RR_BAR_US',frng);
f.YF(frng) = d.YF_(frng); %projections are in database created by |readData|
f.RR_US(frng) = d.RR_US_(frng);
f.RR_BAR_US(frng) = d.RR_BAR_US_(frng);
%
% % Tunes for the near term

p = exogenize(p,'GROWTH',startfcast:startfcast+1);
p = endogenize(p,'RES_Y',startfcast:startfcast+1);
f.GROWTH(startfcast:startfcast+1) = 100*log([2.7 3.9]/100+1);
```

```

p = exogenize(p,'PIE',startfcast:startfcast+1);
p = endogenize(p,'RES_PIE',startfcast:startfcast+1);
f.PIE(startfcast:startfcast+1) = 100*log([4.4 3.7]/100+1);

p = exogenize(p,'RS',startfcast:startfcast+2);
p = endogenize(p,'RES_RS',startfcast:startfcast+2);
f.RS(startfcast:startfcast+2) = [4.5 4.5 4.5];

p = exogenize(p, 'LZ', startfcast);
p = endogenize(p, 'RES_RR_DIFF', startfcast);
f.LZ(startfcast) = [122.1354696];

p = exogenize(p, 'UNR', startfcast:startfcast+1);
p = endogenize(p, 'RES_UNR_GAP', startfcast:startfcast+1);
f.UNR(startfcast:startfcast+1) = [5.5 5.5];

p = exogenize(p, 'PIETAR', startfcast);
p = endogenize(p, 'RES_PIETAR', startfcast);
f.PIETAR(startfcast) = [3.5];

potrng = startfcast:startfcast+9;
p = exogenize(p, 'GROWTH_BAR', potrng);
p = endogenize(p, 'RES_G', potrng);
f.GROWTH_BAR(potrng) = [2.2 2.4 2.6 2.8 3.0 3.0 3.0 3.0 3.0 3.0];

f.RES_Y(startfcast+2:startfcast+8) = [.15 .25 .3 .3 .2 .15 .1];

f.RES_PIE(startfcast+2:startfcast+5) = [.1 .2 .2 .1];
```

Run forecast.

```
su = simulate(mstar,f,frng,'anticipate',false,'plan',p);
s = dbextend(f, su);

% %Alternative parametrizations
% mm = mstar;
% mm(1:3) = mstar;
% mm.beta1 = [mstar.beta1 0.5 0.7];
% mm = solve(mm);

% test = simulate(mm,f,frng,'anticipate',false,'plan',p);

% dbplot(test,{'GROWTH','PIE','RS','Y'},frng);
% dbplot(test,{'RR_BAR','Y'},frng);
```

Save forecast for future use.

```
thisfile = sprintf('GPM_%s_forecast_%s.csv',country,scenario);
dbsave(s,thisfile,Inf,'class',false,'comment',false,'format','%.16f');

thisdir = sprintf('Results/%s/',version);
if ~exist(thisdir,'dir')
    mkdir(thisdir);
end
movefile(thisfile, thisdir);
```

Contents

- `printForecastReport.m` – creates a report of the conditional forecast
- Choose scenario, title and name of report, and ranges for report.
- Load forecast.
- Create forecast report.
- Housekeeping

`printForecastReport.m` – creates a report of the conditional forecast

```
clear all;
close all;
home();

readDefinitions;

fprintf('%s...\n',country);
fprintf('Version to report: %s.\n',version);
```

```
MX...
Version to report: Feb14.
```

Choose scenario, title and name of report, and ranges for report.

You can run several different forecast scenarios on top of the same estimation results. These are differentiated by the `scenario` suffix defined in `runForecast.m`. Choose which scenario(s) to report below.

```
shock = 'f1';
control = '';
if isempty(control) %name and title of report depend on whether or not you are comparing 2 scenarios
    outfile = sprintf('GPM_%s_forecast_%s',country,shock);
    title = sprintf('GPM-%s Forecast: %s',country,shock);
else
    outfile = sprintf('GPM_%s_forecast_%s_vs_%s',country,shock,control);
    title = sprintf('GPM-%s Forecast: %s vs %s',country,shock,control);
end

%Ranges for forecast report;
qrng=qq(2010,1):qq(2012,4); %range for quarterly tables
arng=yy(2010):yy(2013); %range for annual tables
prng=qq(2007,1):qq(2014,4); %range for plots
```

Load forecast.

```
thisfile = sprintf('Results/%s/GPM_%s_forecast_%s.csv',version,country,shock);
shk = dbload(thisfile);
fctname = sprintf('GPM_%s_transform',country);

thisfile = sprintf('Results/%s/estimation_%s.mat',version,estimVer);
tmp = load(thisfile, 'd');
data = tmp.d;

[shk_q, shk_a] = feval(fctname, shk, data);
```

```
*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.LGDP_)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.LCPI_)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.UNR_)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RS_)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.LZ_)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RR_US_)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RR_BAR_US_)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.YF_)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.GROWTH)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.GROWTH4)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.GROWTH_BAR)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.GROWTH4_BAR)'.

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*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.LGDP_BAR)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.G)'.
```

```
*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.Y)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.UNR)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.UNR_GAP)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.UNR_BAR)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.UNR_G)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.PIE)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.LCPI)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.PIETAR)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RS)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RR)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RR_BAR)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.LZ)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.LZ_BAR)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.LZ_GAP)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.YF)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RR_US)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RR_BAR_US)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RES_LGDP_BAR)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RES_Y)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RES_G)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RES_UNR_GAP)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RES_UNR_BAR)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RES_UNR_G)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RES_PIE)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RES_PIETAR)'.
```

```
*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RES_RS)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RES_RR_BAR)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RES_RR_DIFF)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RES_LZ_BAR)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RES_RR_BAR_US)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RES_RR_US)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.RES_YF)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.alpha1)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.alpha2)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.alpha3)'.

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```

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*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.rho_us)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.betaf)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.rr_bar_us_ss)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.unr_ss)'.

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*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.std_RES_Y)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.std_RES_G)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.std_RES_UNR_GAP)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.std_RES_UNR_BAR)'.

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*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.std_RES_PIETAR)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.std_RES_RS)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.std_RES_RR_BAR)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.std_RES_RR_DIFF)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.std_RES_LZ_BAR)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.std_RES_RR_BAR_US)'.

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*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.GDP)'.
```

```
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*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.PCH_GROWTH)'.

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*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.Z)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.CPI)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.LS)'.

*** The above warning occurred when DBBATCH attempted to evaluate 'qq2yy(dq.S)'.
```

Create forecast report.

```
if isempty(control)
    ctrl_q = dbempty();
    ctrl_a = dbempty();
else
    thisfile = sprintf('Results/%s/GPM_%s_forecast_%s.csv',version,country,control);
    ctrl = dbload(thisfile);
    [ctrl_q, ctrl_a] = feval(fctname, ctrl, data);
end

cwd = pwd;
thisdir = sprintf('Results/%s/ReportFiles',version);
if ~exist(thisdir, 'dir')
    mkdir(thisdir)
end
eval(sprintf('cd Results/%s/ReportFiles',version));

run_forecast_report(ctrl_q,ctrl_a,shk_q,shk_a,...
    'PP', [],...
    'country',country,...
    'qrng',qrng,...
```

```
    'arng',arng,...
    'prng',prng,...
    'outfile',outfile,...
    'title', [version ' ' shock ' vs ' control]);

copyfile([outfile '.pdf'],sprintf('%s/Results/%s/',cwd,version));
eval(sprintf('cd %s',cwd));
```

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Transcript written on GPM_MX_forecast_f1.log.
This is dvips(k) 5.96dev Copyright 2007 Radical Eye Software (www.radicaleye.com)
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<D:/apps/MiKTeX_2_7/dvips/base/texps.pro>
<D:/apps/MiKTeX_2_7/dvips/base/special.pro>. [1<tmp_summary1_Cy.eps>
<tmp_summary1_Cy.eps><tmp_summary1_Crs.eps><tmp_summary1_Crs.eps>
<tmp_summary1_Cgrowth.eps><tmp_summary1_Cgrowth.eps><tmp_summary1_Cpie4.eps>
<tmp_summary1_Cpie4.eps><tmp_summary1_growthbar.eps>
<tmp_summary1_growthbar.eps><tmp_summary1_Cunr.eps><tmp_summary1_Cunr.eps>]
[2<tmp_cl_rs.eps><tmp_cl_rs.eps><tmp_cl_y.eps><tmp_cl_y.eps><tmp_cl_pie4.eps>
<tmp_cl_pie4.eps><tmp_cl_growth.eps><tmp_cl_growth.eps>] [3]
```

Housekeeping

```
thisdir = sprintf('Results/%s/',version);

thisfile = sprintf('GPM_%s_forecast_q_%s.csv',country,shock);
dbsave(shk_q,thisfile,Inf,'class',false,'comment',false,'format','%.16f');
movefile(thisfile, thisdir);

thisfile = sprintf('GPM_%s_forecast_a_%s.csv',country,shock);
dbsave(shk_a,thisfile,Inf,'class',false,'comment',false,'format','%.16f');
movefile(thisfile, thisdir);

if ~isempty(control)
    thisfile = sprintf('GPM_%s_forecast_q_%s.csv',country,control);
    dbsave(ctrl_q,thisfile,Inf,'class',false,'comment',false,'format','%.16f');
    movefile(thisfile, thisdir);

    thisfile = sprintf('GPM_%s_forecast_a_%s.csv',country,control);
    dbsave(ctrl_a,thisfile,Inf,'class',false,'comment',false,'format','%.16f');
    movefile(thisfile, thisdir);
end
```