How to create a (mostly) automated table for Bayesian estimation results in LaTex/Lyx

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This document and the attached files should enable you to (semi-automotically) create a table listing priors and posteriors for your Bayesian estimation. While it can in general be used with any array of data in .csv format, I will outline the procedure for an estimation using Dynare.
The result will have a format like Table 1.

Coefficient	Prior Distr.	Moments				Post. 5 & 95 %-iles	
		Mean		Variance			
		Prior	Posterior	Prior	Posterior		
ψ_π	Inv.-gamma	2	1.7451	0	0.0979	1.497	1.9759
ψ_y	Inv.-gamma	0.2	0.1692	0	0.0223	0.1283	0.2087
α	Beta	0.33	0.3875	0	0.0143	0.3717	0.4
α_F	Beta	0.33	0.3094	0	0.0329	0.2504	0.363
CR	Beta	0.12	0.1319	0	0.0081	0.1144	0.1485
CR_F	Beta	0.12	0.0825	0	0.0029	0.08	0.0857
κ_s	Inv.-gamma	11.5	11.418	0	0.3911	10.77	12.028
κ_{sF}	Inv.-gamma	11.5	11.344	0	0.3034	10.631	12.014
θ	Beta	0.2	0.2073	0	0.0068	0.1921	0.2231
θ_F	Beta	0.2	0.2149	0	0.0043	0.2006	0.2318
ϵ_w	Inv.-gamma	5	5.5524	0	0.3438	4.5452	6.459
ϵ_{wF}	Inv.-gamma	5	4.4789	0	0.1845	3.9325	5.1464
κ_w	Inv.-gamma	100	96.492	0	2.3374	90.845	101.86
κ_{wF}	Inv.-gamma	100	101.13	0	2.946	94.025	108.48
κ_i	Inv.-gamma	1.728	2.1655	0	0.0643	1.9624	2.3871
κ_{iF}	Inv.-gamma	1.728	1.8918	0	0.0639	1.7311	2.0492

Table 1: Priors and posteriors for model parameters

So the procedure to get the table is the following:

1. run the Dynare code

2. run my function `DynareEstimResultsToCsv.m` with name of model and (optional) cutoff (to split tables into one for shocks, one for other parameters) as inputs
   Aside: Instead of these two steps, you can also obtain your `EstimOut.csv`

file with any other software and estimation procedure. Just make sure it is lists the results in the following order:

(a) Prior Distribution: Following Dynare[1], these have the following codes: 1 for Beta distribution, 2 for Gamma, 3 for Normal, 4 for Inverse Gamma, 5 for Uniform and 6 for Inverse Gamma 2 (for an outline see here).

(b) Prior mean

(c) Posterior mean

(d) Prior variance

(e) Posterior variance

(f) Posterior 5 percentile

(g) Posterior 95 percentile

3. create .csv file with parameter names by hand (as my `ParamsTex.csv`)

4. add this to your preamble

```
\usepackage{pgfplots}
\usepackage{pgfplotstable}

\pgfkeysifdefined{/pgfplots/table/output
empty row/.@cmd}{
% upcoming releases offer this more convenient option:
\pgfplotstableset{
empty header/.style={
every head row/.style={output empty row},
} } }

% No scientific format figures
\pgfplotsset{x  tick  label  style={/pgf/number  for-
mat/fixed}}
\pgfplotsset{y  tick  label  style={/pgf/number  for-
mat/fixed}} % suppresses 1000 separator
\pgfplotsset{x  tick  label  style={/pgf/number  for-
mat/1000 sep=}}

% for professional tables
\usepackage{booktabs}
\let\hline\midrule
```

Table 2: Put this into your document preamble

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1. See Dynare documentation on GetPosteriorParametersStatistics, look for "pnames".

- Put everything in typewriter font below into an Evil Red Text box within a table (and in there, within a makebox if desired). The code is not easy to grasp at first, but you can play around with it. The first part reads the .csv files and translates them into tables for pgfplot:

```
\centering
\pgfplotstableread[col sep=comma, header=false,
]{ParamsTex.csv}\tabledata
%
\pgfplotstableread[col sep=comma, header=false,
]{EstimOut.csv}\priorpara
\pgfplotstablecreatecol[copy     column     from     ta-
ble={\priorpara}{[index] 0}] {1} {\tabledata}
\pgfplotstablecreatecol[copy     column     from     ta-
ble={\priorpara}{[index] 1}] {2} {\tabledata}
\pgfplotstablecreatecol[copy     column     from     ta-
ble={\priorpara}{[index] 2}] {3} {\tabledata}
\pgfplotstablecreatecol[copy     column     from     ta-
ble={\postpara}{[index] 3}] {4} {\tabledata}
\pgfplotstablecreatecol[copy     column     from     ta-
ble={\postpara}{[index] 4}] {5} {\tabledata}
\pgfplotstablecreatecol[copy     column     from     ta-
ble={\postpara}{[index] 5}] {6} {\tabledata}
\pgfplotstablecreatecol[copy     column     from     ta-
ble={\postpara}{[index] 6}] {7} {\tabledata}
%
\pgfkeys{/pgf/number format/.cd, fixed, precision=4}
%
\pgfplotstabletypeset[
col sep=comma, font=\footnotesize,
% change ordering of columns
columns={0,1,2,3,4,5,6,7},
```

Table 3: LaTeX code to create table I (Change "`EstimOut.csv`" to output of `Dyna-reEstimResultsToCsv.m`)

- The second part defines some layout for the columns (e.g. it "translates" the numbers for the prior distributions in column 1 into text)

```
%
columns/0/.style={column name=, column type={c},string
type},
columns/1/.style={column name=, column type={l},string
type,
string         replace={1}{beta},string         re-
place={2}{gamma},string  replace={3}{norm},string  re-
place={4}{invg},  string  replace={5}{unif},  string
replace={6}{invg2}},
%
columns/2/.style={column name=Prior, column type={l}},
columns/3/.style={column      name=Posterior,      column
type={l}},
columns/4/.style={column name=Prior, column type={l}},
columns/5/.style={column      name=Posterior,      column
type={l}},
columns/6/.style={column name=, column type={l}},
columns/7/.style={column name=, column type={l}},
```

Table 4: LaTeX code to create table II

- The last part defines the headings and lines on top of the columns:

```
%
every head row/.style={after row=\hline,
before    row    ={\multicolumn{1}{c}{Coefficient}    &
\multicolumn{1}{c}{Prior    Distr.}    &    \multicol-
umn{4}{c}{Moments}   &   \multicolumn{2}{c}{Post.   5\
\& 95 \%-iles}\\
\cmidrule(lr){1-2} \cmidrule(lr){3-6} \cmidrule(lr){7-
8}
\multicolumn{2}{c}{} & \multicolumn{2}{c}{Mean} & \mul-
ticolumn{2}{c}{Variance} & \multicolumn{2}{c}{}\\
\cmidrule(lr){3-4} \cmidrule(lr){5-6}
}}
]{\tabledata}
```

Table 5: LaTeX code to create table III

- Again, the content of all three tables (3 to 5) has to be copied into ERT. If Lyx crashes, check first whether the two .csv files you refer to in the ERT exist in the same folder than the document under the given name!

- I also add the Lyx file used to create this document so that you can copy the complete ERT from there. Enjoy!