**DESCRIPTION OF THE PROGRAMS THAT SOLVE STICKY INFORMATION GENERAL EQUILIBRIUM (SIGE) MODELS.**

This directory contains all of the programs that implement the algorithms in the paper: "Sticky Information in General Equilibrium" by N. Gregory Mankiw and Ricardo Reis, published in 2007 in the Journal of the European Economic Association. The NBER and CEPR working paper versions of this paper contain a detailed description of the algorithms.

Written by: Ricardo Reis, 30 August 2006.
Please cite if you use. I do not provide tech. support

All of the programs were written for Matlab 7.0.5. The Bayesian algorithms use the statistics toolbox to draw from a multivariate normal and evaluate the pdf of several distributions.

## 1. REPLICATING OUR RESULTS

The replication can be split into three stages:

Stage 1) Obtaining the MLE results
You have to run the files in the following order:
- Run SIGE_mle.m to obtain the MLE estimates. This will produce an MLEresults.mat file with the maximum-likelihood estimates.
- Run SIGE_mle_vd.m to obtain the variance decompositions at the MLE estimates and for 1000 draws from a normal. These are saved into a file MLEvd.mat.

Stage 2) Obtaining the draws from the Bayesian posterior
You have to run the files in the following order:
- Run SIGE_Bayes.m to obtain a Bayesdraw1.mat, a file with 50000 draws from the posterior. Change line 87 in the program to Bayesdraw2.mat, and line 73 for a different initial point, and run again. Repeat 5 times to have 5 .mat files with 5 independent chains.
- Run SIGE_draws.m. This reads the Bayesdraw#.mat files, computes convergence diagnostics and mixes the draws after discarding a "burn-in" 30,000 of them from each chain. The mixed 100,000 draws from the posterior are saved into Bayes.mat.
- Run SIGE_Bayes_vd.m to obtain the variance decomposition for the 100,000 Bayesian draws, which are then saved in Bayesvd.mat.

Stage 3) Visualizing the results
- Run SIGE_figure1.m to generate the impulse response functions in figure 1 of the paper.
- Run SIGE_Tables1.m, SIGE_Tables2.m, and SIGE_Tables3.m to read off results for Tables 1 and 2

## 2. LIST OF ALL THE FILES

Master programs:
README.pdf -- this file with the description of all the files
SIGE_Bayes.m -- Obtains 50,000 draws from Bayesian posterior of parameters
SIGE_Bayes_vd.m -- Uses draws from Bayesian posterior of parameters, to obtain draws from Bayesian posterior of variance decompositions.
SIGE_draws.m -- Mixes draws from independent Metropolis chain and assesses convergence.
SIGE_figure1.m -- Displays figure 1 in the paper.
SIGE_mle.m -- Produces the maximum likelihood estimates
SIGE_mle_vd.m -- Produces the maximum likelihood variance decompositions
SIGE_Tables1.m -- Displays MLE section of Tables 1 and 2
SIGE_Tables2.m -- Displays Prior section of Table 1
SIGE_Tables3.m -- Displays Bayes posterior section of Tables 1 and 2.

Functions called by these programs:
SIGEconverge.m -- produces Brooks Gellman convergence diagnostics for MCMC chains
SIGEirf.m -- plots impulse response functions
SIGElogl.m -- evaluates value of log-likelihood function given V and Y
SIGEloglik.m -- evaluates log-likelihood function given the parameters
SIGEma.m -- solves the model for inflation, output level, nominal interest rate, real wage, hours, and output gap
SIGEmafive.m -- solves the model for inflation, output growth, nominal interest rate, real wage growth, hours
SIGEmetro.m - Metropoplis-Hastings step in MCMC
SIGEprior.m - Prior probability of a set of parameters
SIGEv.m - computes V matrix useful in evaluating log-likelihood function
SIGEvardec.m - given a set of parameters, produces predicted variance decomposition

Data files:
SIGEdata.mat -- has the data used in this paper

Output files produced by programs:
MLEresults.mat -- produced by SIGE_mle.m has the MLE results
MLEvd.mat -- produced by SIGE_mle_vd.m has the ME variance-decompositions
Bayesdraw#.mat -- produced by SIGE_Bayes.m has MCMC chain from posterior simulation
Bayes.mat -- produced by SIGE_draws.mat has mixed draws from posterior
Bayesvd.mat - has draws from variance decomposition posterior.

## 3. MODIFICATIONS OF THE PROGRAMS

SIGE_Bayes.m -- Can change number of draws, values of calibrated parameters, prior parameters, Metropolis proposal function, starting point.

SIGE_mle.m -- Can change calibrated parameters and initial guesses for MLE search.

SIGE_figure1.m -- Can change this and SIGEirf.m to easily plot solutions for output, i, w-p. If change program used to SIGEmafive.m, can also plot output growth, or D(w-p).