

# Seminar Bayesian Econometrics

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# Why Bayesian Econometrics?(1/2)

- ▶ Bases on the simple rules of probability (Bayes Theorem)
- ▶ Bayesians treats  $\theta$ , the parameter of interest, as a random variable
- ▶ Frequentists, the competitors to Bayesian Statistic, treat  $\theta$  as an unknown constant. Remember: Only  $\hat{\theta}$  is random
- ▶ Bayesians ask: Given the data, what do we know about  $\theta$ ?
- ▶ Frequentists ask: Given  $\theta$ , what do we know about the data?

# Frequentist probability vs Subjective probabilities

- ▶ Frequentist probability:
  - ▶ Probability statements are only possible for random experiments
  - ▶ Random experiments can be repeated arbitrarily often
  - ▶ Examples: dice, coins, random samples
  - ▶ For a frequentist, it is not possible to make a probability statement about the event: “It will be snowing on 1/3/2019”
- ▶ Subjective probabilities:
  - ▶ Probability statements are always possible if there is uncertainty
  - ▶ Random experiments need not be repeatable
  - ▶ Subjective probabilities must satisfy the probability axioms

## Why Bayesian Econometrics?(2/2)

It allows...

- ▶ to incorporate prior information about  $\theta$
- ▶ for probability statements about  $\theta$
- ▶ for probability statements about competing models
- ▶ for probability statements about future outcomes
- ▶ Bayesian estimators often have better frequentist properties than frequentist estimators (e.g. results due to Stein show MLE is inadmissible but Bayes estimators are admissible)
- ▶ But one of the prime reasons to adopt a Bayesian approach is that it may allow feasible inference in situations where frequentist approaches are difficult

# Start of Seminar

- ▶ The Seminar starts in the second half of the semester
- ▶ This gives you the chance to visit my lecture in the first half of the semester of Bayesian Econometrics
- ▶ The idea is that this lecture prepares you for this seminar

# Objectives

- ▶ To implement Bayesian methods on a computer
- ▶ To apply Bayesian methods in a time series context

## Possible topics

- ▶ Bayesian VAR models
- ▶ Panel VARs
- ▶ Vector error corrections models
- ▶ Bayesian Model Averaging vs Bayesian Model combination
- ▶ GARCH vs Stochastic volatility models
- ▶ Global local prior
- ▶ Dynamic Factor models
- ▶ Time-varying parameter models
- ▶ Bayesian Model comparison
- ▶ Estimation of large Covariance matrices in finance
- ▶ and more