

## The Convergence of Bayesian Belief Hierarchies

### Abstract

Agents in an economy or game do not know the value of some parameter  $\theta$ , the "fundamentals". Their beliefs about  $\theta$  are their first order beliefs. Agents do not know the first order beliefs of other agents; their beliefs about this are their second order beliefs. Third order belief are beliefs about beliefs. Etc. An agent's hierarchy of beliefs specifies that agent's beliefs of all orders. At each date agents receive information. I show that under a mutual absolute continuity condition the belief hierarchies of agents converge over time. This condition is a generalization of the Harsanyi (1968) Common Prior Assumption. The convergence result is applied to a model of competitive firm behavior where convergence of optimal actions to the Nash or Rational Expectations equilibrium is obtained.

**Mailing Address:**  
New York University  
Department of Economics  
269 Mercer St.  
New York, NY 10003.