Productivity and Efficiency at Bank Holding Companies in the U.S., 1986 – 2013: Evidence from A Bayesian Stochastic Distance Frontier Model with Time-varying Heterogeneity

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Abstract

This paper investigates productivity and efficiency of bank holding companies (BHCs) in the U.S. over the period 1986–2013. This investigation is performed by estimating a translog stochastic distance frontier (SDF) model with time-varying heterogeneity — a model that is capable of disentangling time-varying unobserved heterogeneity from inefficiency — within a Bayesian framework. We find that failure to allow for time-varying unobserved heterogeneity results in mismeasured productivity and efficiency. Our results from the translog SDF model with time-varying heterogeneity show that the BHCs have experienced an average annual productivity growth of 1.44%. Moreover, the estimates of productivity growth show a clear decline, and our decomposition of productivity growth shows that technical change is the driving force behind the decline. Our results also show that the majority of BHCs in the U.S. exhibit decreasing returns to scale, a small percentage exhibit constant returns to scale, and an even smaller percentage exhibit increasing returns to scale.

Keywords: Productivity and Efficiency; Translog Stochastic Distance Frontier Model with Time-varying Heterogeneity; Bayesian Estimation.

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