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# Productivity growth in large US commercial banks: The initial post-deregulation experience

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## Abstract

We explore productivity growth for a group of 201 large US commercial banks over the initial post-deregulation period from 1984 to 1990, using data envelopment analysis (DEA). We measure productivity growth using Malmquist productivity indexes and isolate the contributions of technical change, technical efficiency change, and scale change to productivity growth. We find overall productivity growth at the rate of about 4.5% per year on average, but productivity declined by 7.61% between 1984 and 1985 and by 0.33% between 1988 and 1989. Our second-stage panel regressions reveal that larger asset size and specialization of product mix associate with higher productivity growth while higher equity to assets associates with lower productivity growth. © 2001 Elsevier Science B.V. All rights reserved.

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## 1. Introduction

The US banking industry has experienced wrenching change over the last 20 years. The financial regulations adopted in the midst of the Great Depression created a tension between federal regulations, and their implementation and enforcement. While regulation generally restricted product-line and geographic expansion of commercial banking activities, financial innovation pushed back the regulatory line. That is, pressures from bankers for less regulation and more freedom of action generally produced implementation and enforcement of existing regulations that were less constraining. In addition, financial innovations sometimes facilitated detours around existing regulations. Many prohibitions on product-line and geographic expansion of commercial banking activities are, or have been, crumbling. This environment was also accompanied in the late 1980s and early 1990s by the largest number of commercial bank failures since the Great Depression. These failures along with mergers (some voluntary, others arranged by the Federal Deposit Insurance Corporation) have significantly reduced the number of commercial banks.

Within this fluid environment, commercial banks faced enhanced competition both from other commercial banks and from other financial institutions, such as savings banks, savings and loan associations, credit unions, money market funds, and so on. After an initial adjustment period, increased competition should enhance commercial bank productivity. To date, however, most empirical analyses of commercial bank total factor productivity during the 1980s suggest little, no, or even negative productivity growth (e.g., Humphrey, 1991, 1993; Hunter and Timme, 1991; Bauer et al., 1993; Wheelock and Wilson, 1999).

We explore productivity growth for a group of large US commercial banks over the initial post-deregulation period from 1984 to 1990. We measure productivity growth using the Malmquist productivity index, employing a recent decomposition under variable returns to scale (VRS) suggested by Ray and Desli (1997). This decomposition isolates the contributions of technical change, efficiency change, and scale change to productivity growth.

Measuring productivity change can employ either parametric or non-parametric methods. We adopt a non-parametric method, data envelopment analysis (DEA), to measure and decompose the Malmquist productivity index. We also identify those individual banks who actually shifted the frontier. Moreover, we complement the non-parametric analysis with two-way random-effects, panel-data regressions (Fuller and Battese, 1974) to explain the differences in productivity change of banks in terms of a number of variables, including asset size, diversification, exposure to risk, capital adequacy, and regional location.

We find, contrary to the existing parametric literature, that large commercial banks experienced productivity increases at about 4.5% per year on average

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