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Technical Change in European Banking

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Abstract

This chapter examines technical change in European banking by applying the Fourier Flexible functional form and stochastic cost frontier methodologies using 13,603 bank observations across 15 EU countries between 1988 and 1995. The results show that technical progress has had a similar influence across European banking markets, making a positive contribution to costs of around 3 per cent every year. Large banks appear to benefit more from technical change than their smaller competitors. We also break down technical progress into its three main components: pure, scale and (input) non-neutral effects. This shows that pure technical change is the main contributor to overall technical progress for small banks (assets size less than $1 billion) and larger banks appear to gain more from technical advances which alter the optimal input mix. Technical change also becomes increasingly scale biased as banks become larger. This implies that technological change increases the minimum efficient bank size for larger banks to a greater extent than for their smaller competitors. Given that technical change is non-neutral with respect to optimal bank size and input-mix, we tentatively suggest that the formation of larger banks may be in the public interest.

2.1 Introduction

Technological progress has been widely cited as one of the major strategic drivers in the EU banking industry (see Arthur Andersen 1993 and Cecchini 1988) yet only a handful of European studies has attempted to quantify its effect on the costs of providing financial services as well its impact on efficient bank size. Maudos et al. (1996)
provide a detailed analysis of the impact of technical progress in the Spanish savings bank sector between 1985 and 1994 and conclude that it reduced average costs by 0.64 per cent and operating costs by 1.93 per cent per annum (total costs were reduced by 0.68 per cent per annum). They also find that larger savings banks have benefited more from technical progress compared to their smaller counterparts. Lang and Welzel (1996) studied the influence of technical change in the German co-operative banking sector between 1987 and 1992 and found that it reduced total costs by 2.5 per cent per annum, with smaller banks experiencing larger cost reductions.

The positive impact of technical progress on bank costs found in the aforementioned European studies is also confirmed in the US literature. For example, Hunter and Timme (1991), using a sample of large US commercial banks for the period 1980–86, also concluded that technological change lowered the real cost of bank production by about 1.0 per cent per year over the sample period. Larger banks also realized a greater percentage reduction in costs than smaller banks. They also found that technological change affected the cost-minimising product mix for all but the smallest banks in their sample. Humphrey (1993) also identifies the positive influence on bank costs resulting from technical change in US banking following bank deregulation. (McKillop et al. (1996) also find that large Japanese banks have benefited from cost reductions through technical progress.)

The aim of this chapter is to extend the established literature by examining the impact of technical change in 15 European banking systems between 1988 and 1995. Using the Fourier Flexible functional form and stochastic cost frontier methodologies we evaluate the impact of technical change for different bank types (private, savings and co-operative banks) and bank sizes in each of the 15 different countries. Technical progress is also decomposed into three types: pure technical change; non-neutral technical progress (a measure of technological change associated with the change in the use of inputs because of variation in input prices); and scale-augmenting technical progress (a measure of technical change which identifies whether the cost-minimising firm size has altered).

2.2 Methodology

An improvement in technology, holding the inputs employed constant, results in more output. As such, technical progress can be defined as the shift in the average cost curve along a given ray induced