Efficiency of labour use in the Swedish banking industry: a stochastic frontier approach*

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First version received: August 1998/Final version received: April 2000

Abstract. The purpose of this paper is to analyse the impact of the deregulation of the Swedish banking industry in the mid-1980s, and the consequent banking crisis, on productive efficiency and productivity growth in the industry. An unbalanced panel of Swedish banks is studied over the period, 1984 to 1995. A total of 1275 observations are analysed for 156 banks that were observed for between two and twelve years. We adopt a translog stochastic frontier model to estimate the labour-use requirements in terms of the variables, loans, deposits, guarantees, number of branches and total inventories, together with the year of observation. The inefficiency effects in the labour-use frontier are modelled in terms of the number of branches, total inventories, the type of bank and year of observation. The technical inefficiencies of labour use of Swedish banks were found to be significant, with mean inefficiencies per year estimated to be between about 8 and 15 per cent over the years of study. However, the confidence interval predictions for these inefficiencies were found to be quite wide.

Key words: Labour demand, labour-use, technical efficiency, banking industry

JEL Classification: C23, D24, G21

* This work was commenced while the first author was on study leave as a visiting professor in the Department of Economics, Göteborg University, during December 1996 to June 1997. Financial support from the Center for Public Sector Research (CEFOS), the Bank of Sweden Tercentenary Foundation, the Swedish Council of Research in Humanities and Social Sciences (HSFR), Jan Wallander’s and Malmsten’s Foundations is gratefully acknowledged. We thank the editor and an anonymous referee for their comments on earlier versions of the paper.
1. Introduction

As in many other countries, the banking industry in Sweden was deregulated in the mid-1980s. Prior to 1985, the Swedish Central Bank (Riksbanken) imposed limitations on the amount by which banks could expand their loan portfolios each year and the interest rates for bank loans were strictly regulated. The competitive pressure was weak. The abolition of the official guidelines for Swedish banks led to a dramatic increase in lending by the banks, many of which embarked on a strategy of rapid growth without effective risk management. The Swedish tax rules, in combination with relatively high inflation and rising property values, created an excess demand for loans that was then to a large extent satisfied. Therefore, this strategy made the banks vulnerable to market volatility and policy shifts. The combination of radical tax reform in 1990, which limited the tax deductibility of interest payments, and the high interest rates since early 1990, contributed significantly to a collapse (about 50% decrease) in real estate values. The crisis was at its apex in the fall of 1992, when the government, as an emergency measure, introduced guarantees for the entire liability side of the balance sheets of Swedish banks (see Macey (1994) for a review of the Swedish banking industry).

Cost cutting, mergers and acquisitions followed the financial disruptions that occurred after 1992. The financial situation of the banks gradually improved. At the same time, the banking industry was internationalised, with a slowly growing international competition domestically and establishment of offices abroad. However, the competitive pressure was quite weak, and most “crisis banks” were able to recover financially. The rapid return of Swedish banks to profitability suggests that the crisis was attributable to liquidity problems rather than insolvency, in a balance sheet sense.

Berger and Humphrey (1997) reported that of the 122 efficiency analyses of depository financial institutions, covering 21 nations, rather few studies have evaluated the performance of the banking industry during a period of deregulation. The purpose of this paper is to analyse the impact of the deregulation and the consequent banking crisis on productive efficiency and productivity growth in Swedish banking using a stochastic frontier analysis (SFA). We adopt a translog stochastic frontier input-requirement function to estimate labour use to benchmark the relative performance of Swedish banks. The input-requirement frontier is expressed in terms of the five variables, total loans to the public, deposits, guarantees, the number of branches and the total inventories, together with the year of observation. The inefficiency effects in the input-requirement frontier are also modelled in terms of the number of branches, inventories, the type of bank and the year of observation. Only about 20 per cent of the studies cited by Berger and Humphrey (1997) used a stochastic frontier approach, but none of these sought to explain the variations of the inefficiency effects in terms of other variables, in a single-stage approach, as in this paper. One weakness of our approach is that, if the functional form is misspecified, the measured efficiency may be confounded with the specification errors.

The very popular non-parametric method, data envelopment analysis (DEA), is a major competing approach to stochastic frontier analysis. This approach imposes less structure on the frontier but it does not allow for random errors. It is not possible to determine which of the two major approaches dominates the other because the true level of efficiency is unknown. In DEA,