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Bank competition efficiency in Europe: A frontier approach

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ABSTRACT

There are numerous ways to indicate the degree of banking competition across countries. Antitrust authorities rely on the structure-conduct-performance paradigm while academics prefer price mark-ups (Lerner index) or correlations of input costs with output prices (H-statistic). These measures are not always strongly correlated within or across countries. Frontier efficiency analysis is used to devise an alternative indicator of competition and rank European countries by their dispersion from a "competition frontier". The frontier is determined by how well payment and other costs explain variations in loan-deposit rate spread and non-interest activity revenues. Overall, differences in competition appear to be small.

1. Introduction

A recent EC report on retail banking in Europe outlined how bank fees for payment and other banking services often differ markedly across European countries (European Commission, 2007). The report noted large cross-country differences in deposit account maintenance fees, payment transaction fees, card interchange fees, deposit interest rates, account switching fees, and other service prices. It also noted important differences in bank profitability as well as banking market concentration. While it was recognized that differences in bank costs and productivity would be one reason for the variation in bank service fees and interest paid on deposits, the tone of the report was that many of the differences were likely "too large" to be due to cost influences alone, suggesting that differences in competition may also account for much of the observed variation. As retail banking accounts for about half of total banking activity in Europe (or around 275 billion euros annually), employs some 3 million people, generates close to 2% of European GDP, and is used by almost the entire population, it is clear that the competitive efficiency of this sector has important implications for the realized efficiency and welfare of individual countries (European Commission, 2007).

Bank retail fee and service pricing revenues are essentially determined by three drivers: (1) the level of underlying costs; (2) the productivity of banks in producing their services; and (3) the level of market competition which may permit them to obtain revenues that exceed a normal return on invested capital or equity. While this broad framework – expressed as: retail banking revenues = f (costs, productivity, competition) – is well-accepted, antitrust authorities and academics typically focus on indicators of competition and their apparent association with revenues and prices. The implicit maintained hypothesis is that the share of revenues not associated with a given competition measure is due to underlying cost and productivity influences or possibly variation in total demand and risk.

In practice, antitrust authorities rely on the structure-conduct-performance paradigm to indicate the current level of market competition conditional on information regarding the ease of new firm entry. Evidence of the possible abuse of market power is often provided by a Lerner index. Importantly, this approach also provides an indication of potential future market competition should market structure change via mergers or acquisitions. Academics prefer price mark-up measures (Lerner index) or correlations of changes in input costs with output prices (H-statistic) to infer current and past levels of competition. While there is disagreement about which of these three measures may "best" reflect market competition, the expectation is that since they purport to measure the same thing they are all positively correlated. Unfortunately, this expectation is not always met. These measures are almost unrelated when compared across European countries over time and can be negatively related within the same country over time (Carbó et al., 2009). Consequently, the choice of which measure to use may affect the outcome.

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Table 1
Revenue and cost growth rates: 11 countries, 1987–2006.

	Revenue 1	Operating cost (OC) 2	Non-interest income/OC 3	Spread/OC 4	PL 5	Labor/deposits 6	Payment cost 7	ATM/deposits 8
Sweden	7.0%	4.4%	7.2%	−1.8%	5.8%	−6.0%	−3.3%	−3.7%
Norway	1.5	2.3	1.5	−2.5	5.3	−7.0	−4.4	−2.1
Netherlands	7.7	6.5	4.2	−1.1	4.6	−7.3	−4.5	6.4
Belgium	8.0	3.8	4.7	3.7	4.5	−7.6	−3.6	3.7
Finland	2.7	1.6	2.5	−0.2	3.1	−8.9	−4.8	−5.6
France	6.1	4.3	7.1	−1.6	4.6	−5.3	−2.7	2.0
Denmark	4.9	3.7	7.2	−0.9	4.9	−5.4	−5.0	5.0
Germany	4.2	5.5	3.0	−2.5	4.4	−5.4	−3.9	3.9
Italy	4.5	3.8	3.8	−0.9	2.6	−6.0	−3.2	4.8
UK	5.0	6.5	−0.4	−1.8	5.4	−7.4	−3.2	−0.7
Spain	2.4	4.2	6.0	−3.9	3.8	−6.7	−6.5	4.3
Average	4.9	4.2	4.3	−1.2	4.4	−6.6	−4.1	1.6

Our approach in this paper is essentially the reverse of that used in the competition literature. Instead of directly measuring competition with typically one (rarely two) of the three indicators outlined above – as in retail banking revenues = f (competition) – and implicitly maintaining that the unexplained portion of revenues is likely due to cost and productivity influences, we focus on the cost and productivity influences – as in retail banking revenues = f (costs, productivity) – and maintain that the unexplained portion of revenues essentially reflect the influence of competition. In this sense we borrow from cost efficiency frontier analysis and develop a "competition efficiency frontier" and rank European countries by their relative dispersion from this frontier.

In what follows, Section 2 outlines how bank revenues have changed over 20 years (1987–2006) across 11 European countries. Two revenue flows are distinguished: one concerns bank non-interest revenues and the other reflects revenues generated from their loan-deposit rate spread. This distinction is important since unit non-interest revenues have been rising over time while unit spread revenues have been falling. The application of frontier analysis to the measurement of relative banking market competition across countries is outlined in Section 3 as is our econometric framework. The resulting competition frontier and identification of country rankings based on their dispersion from this frontier are presented in Section 4. Elasticities of the effect of payment costs and bank productivity on two classes of banking revenues are presented in Section 5. In Section 6, the competition frontier results are contrasted with "standard" cross-country competition indicators such as an H-statistic (from Bikker et al., 2007) along with a market concentration ratio and a profitability measure (from European Commission, 2007). Our conclusions are presented in Section 7.

2. Changes in bank revenues and costs

In assessing banking competition, interest income from securities and the expense from other liabilities for borrowed money (e.g., large CDs, interbank funding) are market determined so variation across banks is due almost entirely to different balance sheet compositions rather than market power. This leaves reported non-interest income (reflecting fee income and some trading gains) and income from the computed spread between loan and deposit rates times the level of deposits raised. The annual average growth of the sum of these two income sources over 20 years (1987–2006) is shown in Column 1 of Table 1 (Revenue).[1] Sweden, the Netherlands, and Belgium experienced annual revenue growth rates of 7% or more while for Norway, Finland, and Spain this revenue growth was less than 3%. Averaged over all 11 countries, annual revenue growth was 4.9%. Operating costs in Column 2, composed of labor, physical capital, and materials expenses, reflect the input costs incurred to support the revenue expansion of Column 1.[2]

In most cases, banks that experienced higher growth in operating costs also generated greater growth in their reported non-interest and computed spread revenues. However, this was not one-to-one. Indeed, most countries experienced higher growth in revenues than in their operating cost. Only for Norway, Germany, and the UK was the situation reversed. Overall, revenues grew by 4.9% a year while an approximation of their underlying operating cost grew by 4.2%. Over 20 years, this implies that revenues expanded by 160% while costs rose by 128%, a difference of 32 percentage points. Lacking cost accounting data, it is not possible to determine more precisely the degree to which bank revenues may have exceeded the growth of their underlying costs.[3] Even so, this simple calculation is suggestive of the ability of banks in the majority of our 11 countries to raise revenues more rapidly than their costs.

While bank revenues are expanding overall, their source is shifting. Revenues obtained from the loan-deposit rate spread are falling as a percent of operating cost (Column 4) while revenues associated with non-interest income activities are rising (Column 3). Lepetit et al. (2008) suggest that this substitution is consistent with the former acting as a "loss leader" for the latter. This shift in revenue sources is important since academic analyses of banking competition that use the so-called new approach to IO and judge the level and change in competition from price mark-up analysis (Lerner index) or the H-statistic typically focus only on more easily obtainable loan and deposit prices (e.g., Covosier and Gropp, 2002; Northcott, 2004; and many others). As revenue from non-interest income activities across our 11 countries was 20% in 1987 but 44% by 2006, much of the current banking competition literature which requires price information for implementation is increasingly looking only at part of the competition picture. While the one-time collection of otherwise unavailable bank pricing data contained in the EC report on retail banking (European Commission, 2007) is a welcome addition, there is no information on the

[1] These growth rates and all data used in this analysis are based on US dollar purchasing power parity values. This was necessary to maintain cross-country comparability since the euro did not exist prior to 1998.

[2] The revenue and cost variables in Table 1 do not include interest income nor interest expenses, except for the loan-deposit rate spread. Revenues attributed to this spread are included in Column 1 of the table. Banks set their spread depending on the general level of market interest rates and their view of their competitive position in the loan and retail deposit markets.

[3] This problem is not just one of the unavailability of internal bank data. No bank has such cost accounting data and those that do have some approximation to the illustration presented here certainly do not have it for 20 years.