

Executive Summary

As a result of the implementation of the Second Banking Directive in January 1993 and the introduction of the Euro in 1999, cross-border competition in European banking should increase in the coming years. In light of this development, the question naturally arises as to the effect that increased competition will have on the structure of banking in Europe. Will large, universal banks come to dominate the industry, or will small, specialized banks win out in the end?

Economic theory suggests that the market structure that will prevail in the long run is the one that is the most cost efficient, a natural monopoly being a case in point. The following study adopts this view by focusing on the relative cost efficiency of European banks.

Cost variations across firms emanate essentially from two sources: inefficient operation, representing deviations from a best-practice frontier (frontier inefficiency), and unexploited economies of scale and scope, which the best-practice frontier may provide. Scale and scope economies confer cost advantages on large, diversified banks or - in the case of diseconomies - on small, specialized firms, whereas frontier inefficiency is not, as a rule, linked to firm size or output mix.

It is important for policy makers to distinguish between these two sources of cost variation as they carry different policy implications. Frontier inefficiency signals insufficient competition and supports the adoption of measures aimed at decreasing regulation and fostering competition, whereas economies of scale and scope pose a threat to competition and suggest tightening regulatory measures.

To date, virtually all cross-country bank efficiency studies focus solely on cost efficiency and ignore risk and revenues. Such a narrow focus can lead to misleading results, however. Failure to consider risk discriminates against banks that choose to adopt cost-intensive measures to reduce risk, making them appear inefficient although they may be operating optimally given their risk preferences. Concentrating solely on cost, on the other hand, causes banks that choose to incur additional costs to increase product quality and hence revenues to seem inefficient. To avoid these biases, one needs to take bank portfolio risks and revenues into account, along with cost. Incorporating revenues changes the direction of orientation from a cost to a profit perspective. The following study, by considering risk and revenues along with costs, represents the first cross-country bank efficiency study that systematically examines the impact of including risk and revenues on measured efficiency.

The following issues stand at the forefront of this study:

- How great is the efficiency variation across banks in Europe?
- What are the sources of efficiency variation?
- What role do economies of scale play, and which scale is optimal?
- Which national banking markets are more efficient, which less so?
- What effect does including risk and revenues have on measured efficiency?
- What implications do the results carry for future structural change and policy?

The original proposal also foresaw investigating changes in efficiency across the sample time period. The inclusion of dynamic aspects of efficiency would have required FF 145,000 for research assistance, as stated in the original proposal. Since funding for research assistance was limited to FF 100,000, we were forced to drop this part of the proposal.

Our sample consists of 1783 commercial and savings banks that were operating in Europe (EU, Norway and Switzerland) for one or more years during the period 1993-97. Total assets of the banks in the sample average roughly 1.6 billion US dollars. The median size lies at a mere 0.6 billion US dollars, however, indicating that the majority of banks in the sample (roughly 75%) are of less than average size. We employ non-parametric frontier estimation (data envelopment analysis) to measure inefficiency.

Our study yields the following results:

- The average level of total efficiency (both frontier and scale) of all banks in our sample ranges from 37 to 57%, depending on the choice of perspective and the treatment of risk. This is about 10 percentage points lower than what other cross-country studies yield, although their results do not always lend themselves to direct comparison with ours.
- Roughly 10% of this measured inefficiency is due to unexploited returns to scale (scale inefficiency). The remainder stems from the failure of the banks to operate more efficiently at their given scale (frontier inefficiency). This finding suggests that banks have more to gain from improving the efficiency of their operations at their fixed scale than from adjusting their scale to optimal size, a common result of other studies.

- Scale and frontier inefficiency do not tend to offset one another. In other words, scale inefficient (efficient) banks are not, as a rule, more frontier efficient (inefficient) and vice versa.
- Depending on the chosen perspective and the treatment of risk, optimal scale varies between 0.5 and 1.5 billion US dollars in total assets. These values correspond approximately to the median and mean size, respectively, of the banks in our sample. Previous cross-country studies yielded larger optimal scales, ranging from 3 to 60 billion US dollars.
- Based on their level of scale efficiency, the banks in Austria, Denmark and Switzerland appear to be too small on average, and those in France too big. The other countries present a mixed picture. This is particularly true of Germany, where the majority of banks seem too big when risk is ignored and too small when risk is considered, implying the presence of strong financial economies of scale in German banking, a concept explained below.
- The average level of frontier efficiency in European banking varies appreciably across countries, ranging from 16% in Greece to roughly 80% in Denmark and the Netherlands, depending on the choice of perspective and the treatment of risk.
- Banks in Denmark, France, Luxembourg and Sweden are - irrespective of perspective and risk - the most frontier efficient on average, while those in Greece, Italy, Portugal, Spain and the United Kingdom are the least so. Other cross-country studies yield similar findings with regard to Denmark, Sweden and Portugal. Otherwise little unanimity exists, particularly because efficiency is a relative concept, only pertaining to the countries sampled, and these vary from study to study.
- Frontier efficiency varies more within than across countries, implying that national banking markets themselves are not highly integrated, or at least not in a state of competitive equilibrium. On the other hand though, national borders may not demarcate relevant banking markets. To what extent this may be true was not investigated.
- Based on the notion that cost and profit efficiency should vary less across banks in integrated markets in competitive equilibrium, the national banking markets in Denmark, Germany and Norway seem the most integrated, and those in Italy, Portugal, Spain, Sweden and Switzerland the least so. The fact that the more (less) integrated national markets also tend to be the more (less) efficient suggests that increasing integration fosters greater frontier efficiency. This result supports measures aimed at integrating national banking markets.

- According to our findings, frontier efficiency increases with scale and decreases with scope and the degree of engagement in retail banking. Hence, large, specialized and/or less retail-oriented banks are more frontier efficient, placing them in a better position to meet increased competition.
- The inclusion of risk increases optimal scale, implying that larger banks are better able to economize on risk. US studies produce similar results. This size advantage is explained in the literature by the greater ease with which large banks may be able to diversify their portfolios, thus lowering risk and hence capital costs (financial economies of scale).
- Optimal scale however decreases when a profit perspective is chosen over a cost perspective, implying that revenues fail to keep pace with costs as the size of a bank increases (revenue diseconomies of scale). Previous studies do not provide a basis of comparison on this issue.
- Financial economies and revenue diseconomies tend to neutralize each other, leaving optimal scale unaffected.
- The inclusion of revenue increases a bank's frontier efficiency on average. This meets with US findings but contradicts other cross-country studies that consider revenues along with costs. Our finding suggests that part of measured cost inefficiency results from the failure of cost studies to control for higher quality bank output and revenues achieved through higher costs.
- Incorporating risk must increase average measured frontier efficiency since including it introduces an additional constraint, which necessarily lowers the scope for efficiency improvement and hence measured inefficiency. The variation of efficiency across banks, on the other hand, need not change.
- The inclusion of risk reduces the variation of cost efficiency across banks, implying that some of the higher costs that seemingly cost inefficient banks incur is directed towards lowering risk. In other words, lowering risk is not costless. Hence, failing to control for risk will make risk-adverse banks appear less cost efficient.
- Controlling for risk does not affect the variation of profit efficiency across banks, however, intimating that the lower returns that less efficient banks achieve for given costs are not a result of greater risk aversion but rather poor investments.

In total, our results do not suggest that policy makers need fear that the emergence of a single European market will lead to a high degree of concentration in the banking industry. The economies of scale are simply not there: neither with respect to cost, to profits nor to risk diversification. The large variation of efficiency across European

banks does imply, however, that market convergence and increased competition could engender a major shake out in the industry. Since measured frontier efficiency increases with size and decreases with scope, large and/or specialized banks should be at an advantage under increased competition.