INDICATORS OF POTENTIAL EXCESS CAPACITY IN EU AND US BANKING SECTORS

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Introduction

The issue of potential excess capacity in banking is a topic of interest to supervisors and central banks, as well as to the banking industry itself. In recent years, many commentators have suggested a relation between the emergence of such excess capacity and the development of banking in an increasingly global and deregulated situation with rapid technological development. In this context, excess capacity might on the one hand be seen as making excessive risk taking in order to maintain profitability more likely (see BIS 1996), while on the other the potentially disruptive consequences of a rapid removal of capacity from the banking sector are also seen as a cause for concern. From a viewpoint of competition policy, there is also the issue of whether the removal of excess capacity may lead to concentration and risks of anti-competitive behaviour.

In this overall context, this paper considers the conceptual and policy issues raised by excess capacity in banking and illustrates the various indicators of potential excess capacity using data for EU countries, with comparative data provided from the US. For EU countries, such indicators are, it is suggested, of interest notably in the light of the advent of EMU., which will act to integrate banking sectors across the Union much more closely. The paper does not seek, however, to draw conclusions about whether excess capacity is present in any individual countries. The paper is structured as follows. Section 1 considers conceptual aspects of excess capacity. It shows that the concept is by no means straightforward, and is linked both to technological and market conditions. Section 2 addresses empirical measurement of excess capacity and underlying factors, using information from the US as well as the EU. In Section 3 the paper assesses policy issues. Three Appendices focus respectively on the problems of output measurement in banking, the measurement of capacity across the financial system as a whole, and some issues raised by mergers as a means of eliminating excess capacity.

1   Conceptual and measurement issues relating to excess capacity

This section looks at the concept of excess capacity both in general and in the specific industry of banking. It is shown that for all industries, while the concept of excess capacity has intuitive appeal, it

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is difficult to define and measure. It is also closely linked to the underlying competitive structure of the sector. As outlined by Frydl (1993), two separate concepts can be distinguished, namely "engineering" excess capacity and "economic" excess capacity.

1.1   Concept of "engineering" excess capacity

"Engineering" excess capacity is closely related to the concept of the "output gap" in macroeconomics, measured on the "short term" assumption that the supply of factors of production - labour and capital - is fixed. In the "output gap" paradigm, excess capacity emerges at a macroeconomic level when aggregate demand falls below that needed to employ all available resources in terms of labour and capital. Excess capacity is then the difference between maximum potential output and prevailing output, where the former is usually defined by means of a trend calculation or explicit production function. Alternatively, an estimate of excess capacity in this sense may be derived from forms of survey, which pose the question whether firms could increase their outputs without increasing investment. Note that at the macroeconomic level one may justifiably disregard "economic behaviour" whereby factors of production are redeployed between industries in response to signals from prices, and consider production relations purely in terms of technological relations (another name for potential output, which illustrates this, is that potential output is a point on the "production possibilities" frontier).

Such an engineering approach can in principle also be applied at the level of an individual industry, at least when output is well-defined. But the problem that arises in such a case is that the amount of factor resources cannot be considered as fixed even in the short term; so-called 'variable' factors of production such as labour can always shift between industries. Indeed, assuming, as is reasonable, that the relationship between capital and labour inputs is not entirely fixed, the employment of labour and other variable factors in a given industry will depend on the level of demand and relative output prices in the industry. Such shifts will, however, be limited if factors of production are highly specialised and hence "specific" to the given industry.

With regard to the application of this approach to banking and other financial services, several problems arise, namely that output is itself ill-defined (see Appendix 1 and Colwell and Davis 1991) so statistical trend-fitting to the time series of actual output - the usual method of calculation - cannot give a meaningful approximation to potential output. Moreover, and following the general point noted above, banking and financial services use a certain amount of "non-specific" capital, such as office buildings, whose usage may respond even in the short run to output price changes.

1.2   The "economic concept" of excess capacity and its link to competitive conditions

The discussion above brings one to *the "economic concept" of excess capacity* and leads one to consider whether it is a superior approach in the case of banking and other financial services. "Economic" refers to the fact that the concept rests on economic criteria of profit maximisation or cost minimisation.

Standard industrial organisation analysis shows that firms typically face a "U" shaped relationship between costs and output for a given scale of output, i.e. there is a level of output which minimises average costs. There may also be economies of scale, i.e. average costs may be lower at a larger scale of operations (see Chart 1, from Frydl (1993)). The implications of these patterns vary depending on the industrial structure, in particular whether new competitors may or may not enter the industry.

1.2.1 The case of free entry

In a *competitive industry, with free entry of new firms*, any level of output below the cost minimising one is not viable in the long run, as the firm in question would be earning less than "normal economic profits", that is, the minimum needed to stay in the industry given profit opportunities elsewhere in the economy. It may either be showing positive or negative cash flow per se[2]. In the former case it will be restructured, taken over or closed down in the long term. If it is losing money, it will default to creditors in the medium term when its liquid assets and borrowing capacity are exhausted.

Following this argument, excess capacity may be said to exist when at least one firm in an industry is operating in the short run at an output level which is below the optimum for the firm's scale of operations (Shapiro 1989). Full capacity for a firm is defined as the output level at which variable costs per unit output are minimised.

However, an industry may be free of excess capacity in the sense that firms are minimising costs at their short term equilibrium level of output, but it may be operating at a non-optimal firm size, if there are long run economies of scale in the industry (i.e. larger firms have lower average costs). Such a situation may persist if small firm, do not wish to take the risks associated with rapid expansion such as the need for heavy external financing. So firm size may remain inefficiently low. It may indeed be emergence of sizeable excess capacity when competition intensifies which forces the industry into a rationalisation via the need for large scale mergers and acquisitions.

Note also, however, that in the case of banking the evidence for the existence of economies of scale is not persuasive. Certainly, beyond an asset size of $1 billion, there may be rather few benefits in terms of average costs to be reaped. Very large banks may have diseconomies of scale, with average costs

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[2] Although a firm may be able to reduce output to a certain extent below the cost minimising level, in response to changes in prices or demand, while earning positive albeit sub-normal profits, there soon comes a point where further cuts in output lead to actual losses.

tending to rise, thus implying that they are best advised to *reduce* the scale and/or scope of their operations.

1.2.2 The case where entry is restricted

In a *non-competitive industry, where entry is restricted by regulation and output prices artificially high*, perhaps also with extensive cross-subsidies, cost minimisation cannot be assumed to hold, and the concept of excess capacity becomes more complex. Two firms in the same industry and with the same technology may be operating at the same scale, but one may have higher costs owing to so-called X-inefficiencies (differences in average costs arising from differing quality of management and organisation of work). Such X-inefficiencies may be durable where entry is restricted, as firms are not under pressure to minimise costs. X-inefficiencies may have been rife in banking prior to deregulation (Berger and Humphrey 1990a)

Equally, where entry is restricted, firms may have a combination of X-inefficiency and inappropriate levels of output, while managing to survive given the inappropriately-high level of output prices. The situation may entail overproduction of "quality" of banking services. One illustration could be the case of deposit regulation, which gives incentives to cross-subsidise activities (leading e.g. to overbranching). Such latent excess capacity may, however, become more threatening when an industry is deregulated, profitability declines and the excess capacity becomes "open".

1.2.3 Other paradigms of competition

It should be noted that the discussion so far is oversimplified. Industrial organisation cannot be considered solely in terms of the polar alternatives of free and restricted entry. Even when entry has been liberalised, there are three possible alternatives to the traditional "perfect competition" paradigm, namely monopolistic competition, contestable markets and strategic competition.

The idea of "<u>monopolistic competition</u>" may have a role to play, in that banks may be seen as having a form of 'spatial monopoly' in their local area, which implies that there is a degree of product differentiation even with free entry to the sector as a whole (Dietsch 1994, Vesala 1995). Then, given product differentiation, firms may maximise profits when producing a level below the cost minimising level, and there is 'sustainable' excess capacity. Technically, the firm faces a downward sloping demand curve, such that restricting output may raise price and thus be profit maximising. Because of free entry and lower production per bank, more banks enter the sector than would be the case under perfect competition. Thus, when price competition is suppressed by collusion or regulation there turns out to be an excess capacity problem when the forces of competition are set free.

An example of the above may be given as regards deposit collecting. For example, branch networks may grow rapidly when there are restrictions on deposit rates, as an alternative means of competition; setting up a branch is profitable until the marginal cost of collecting deposits (deposit rate plus the marginal cost of investment) is the same as a cost of an alternative source of finance (from the interbank market, central bank etc.). Deregulation tends to stir up widespread competition and may lead to situations of excess capacity, partly by rendering existing capacity, which was built for a "structurally regulated" market with artificially low deposit rates, redundant. Similarly, economic policies that favour investment in capital[3] may create inefficiency and excess capital (in banking this may result in extensive branch networks, extensive networks of teller machines, cash dispensers etc.). Again, with deregulation and increased influence of market forces in general, the low or negative profitability of the investments may be revealed.

The theory of <u>contestable markets</u> (assuming free entry and exit to the market, but also substantial economies of scale) can also be used for banking markets, because it can be applied to markets with only few players and potential competition, which is often the case in banking (Baumol 1982).

Sunk costs may be important in retail banking (i.e. costs that may not be recovered when leaving the industry - such as relationships, reputation and expertise). This suggests that there also may be elements of <u>strategic interaction</u> among banks to take into account (Tirole 1989).

However, it is evident from the literature (see Section 2) that the operational implications of the theory and competition in banking and of financial intermediation are difficult to implement, and thus in practise the concept of excess capacity is in general discussed in terms of simply comparing different overall indicators of banking markets.

1.3   Measurement issues arising from the economic concept of excess capacity

If one assumes competitive conditions and free entry prevail, one may employ a corollary of economic excess capacity to good effect, namely that an industry where there is free entry and hence output prices are at a competitive level in excess capacity will be earning negative economic profits. Thus, less than normal reported earnings may provide a summary of excess capacity in the industry.

An alternative index of excess capacity - particularly relevant for banking - is the provisions/net income ratio. The underlying argument is that firms are driven by excess capacity to make risky loans at inadequate spreads, hence in a recession banks are unable to earn sufficient interest income to cover

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[3]   For example, due to tax exemption of interest expenditure in investment and regulated rates of interest, real interest rate were artificially low, and even negative, in some countries in the 1960s and 1970s.

their losses. Nevertheless, it should be noted that this measure can also reflect other factors, such as poor underwriting skills, inadequate pricing and market distortions.

For a non-competitive industry the link of profitability or risk to capacity may not be close. If entry is restricted, either for market or regulatory reasons, and/or each firm has a degree of local monopoly power, subnormal profits imply excess capacity but the opposite is not necessarily the case. Also, if firms can make satisfactory profits regardless of their cost situation, they will not be driven to recover profitability by making risky loans. Thus, if entry is restricted it may be appropriate to focus directly on the dispersion (and in cross-country comparisons the level) of cost/income ratios in order to assess the potential degree of excess capacity in the context of artificially high output prices and X-inefficiencies. Other proxies may include the staffing and density of branches of a banking sector. In effect, such measures indicate the degree to which excess capacity may become evident - and potentially disruptive - when the sector is deregulated.

These point are developed further below.

1.4   Causes of excess capacity

Employing the above framework, it is evident that emergence of a situation where the level of demand is insufficient to maintain normal profitability at the current scale of operations *may result from various causes* that may be interrelated and reinforce each other, as follows:

(i)   there may be a *cyclical or structural decline in demand* for the industry's product;

(ii)   *technological shocks* may make existing capacity redundant. Regarding the banking sector, this may be particularly relevant for deposit collecting that traditionally was rather dependent on branches, and may be more easily done by using telebanking, internet etc. Moreover, such developments reduce entrance barriers for outside competition;

(iii)   the *distribution of demand may shift* between firms, with successful firms gaining market share at the expense of unsuccessful, with the latter pushed into a situation of excess capacity, even if demand at the industry level is unchanged;

(iv)   *new competitors may enter* the industry, attracted by profit opportunities, and by reductions in the costs of entry and of exit. But this may lead some weaker producers to a situation of excess capacity - or if entry is sufficiently large scale, such problems may arise for the entire industry;

(v)   *changes in regulation* or economic policies are a potential cause of excess capacity, which affect costs of or even feasibility of entry and exit;

(vi)   where there are sunk costs, *firms may engage in forms of strategic competition* (e.g. build-up of capacity to discourage new entry) which may itself lead to excess capacity;

(vii)   excess capacity of a benign type may even hold in a rapidly growing industry. Firms may expand the scale of operation and take short term losses or low profits in a hope of profiting from

anticipated increases in demand, which will remove excess capacity. This underlines that a 'snapshot' of an industry may not capture excess capacity well. Rather, to be a cause for concern, excess capacity needs to be unanticipated, unusual, chronic and not diminishing of its own accord.

As will be seen in Section 2.1 below, elements (i), (ii), (iv), (v) and (vi) may have been important in banking difficulties and excess capacity in the US, and may be so in the EU, especially after EMU. Section 3 suggests that the differing causes of excess capacity may also condition the appropriate policy response.

1.5   Conclusion

It has been shown that the concept of excess capacity is closely related both to that of efficiency - both productive efficiency and allocative efficiency. The former requires that whatever is produced, it should be at minimum cost, the latter implies that what is done should meet consumer/market needs at prices which reflect the cost of provision (see Neven 1992). Whereas when entry is restricted, the pressures to be efficient are weak or absent, and latent excess capacity may develop at the <u>industry level</u>, a firm in a competitive product market has in general incentives to pursue efficiency and hence in due course to eliminate excess capacity. The main incentive to productive efficiency will be the threat of bankruptcy or a hostile take-over owing to inadequate profitability. The firm must also pursue allocative efficiency since otherwise consumers would shift to other firms offering lower product prices. The fact that excess capacity is related to both aspects of efficiency also points out the close relation of the concept to competitive conditions as well as technology.

A possible summary criterion for defining excess capacity at the <u>firm level</u> (Dietsch 1994), is that to be in excess, the installation of the relevant capacity must later be a matter of regret to management. Such a criterion would also distinguish the type of excess capacity resulting from consumer choice (so-called 'monopolistic competition') from forms where it is a potential cause for concern.

2   Measurement of excess capacity and underlying factors

2.1   Summary of methodological issues

How should excess capacity be measured in the light of the discussion above? Most studies look at overall measures of the performance of the banking sector, either using aggregate data per se or by summarising data on individual banks, implicitly ignoring the precise competitive situation prevailing in the market - be it free or restricted entry, monopolistic competition, contestable markets or strategic competition (for an exception, see Shaffer 1995). In some ways this approach can be justified. As long as the distribution of market power remains stable, summary measures of changes in levels of profitability may, for example, give an indicator of excess capacity regardless of the precise

competitive paradigm. Also if small firms tend to be monopolistic and large firms competitive, it may have little impact at an *industry* level. Such a pattern may prevail in banking, where in many countries local banks have some monopoly power while larger institutions operate in competitive international markets. Caution is still needed in selecting a time period, however. If it is too short, there is a risk that it will be dominated by cyclical and one-off events. This justifies looking at periods of 5 years or more, as in Davis (1997), if the data allow. Also, overall measures may be of particular interest in a cross-country analysis, as is the case here.

However, it is not clear that industry-average profitability using aggregate data is always the ideal measure for excess capacity even for a competitive industry. On the one hand, if the whole industry shows low profitability or makes losses, it is an a priori indicator of excess capacity. But the existence of constant, positive profitability on average may not indicate the absence of excess capacity. If demand weakens moderately, some firms may face excess capacity, while other raise productivity, shift scale and product mix and thus improve profitability. Then average profits may not change, and the appropriate measure of excess capacity would be the share of firms with below normal or unusually low profitability. This suggests that summary measures using data derived at the level of the bank may have a useful role to play. How many banks are making "adequate" levels of profitability? Such an exercise, of course, requires a benchmark for adequacy of profitability. Such a measure is suggested and employed below.

More generally, a problem with a profits based measure is that in the financial sector declines in profitability can at least in a cyclical upturn be offset by increasing the level of risk. A complementary approach is to look at the level of risk in the banking sector, on the view that excess capacity exists if risk increases sharply in relation to profitability. This implies that the bank in question - or the sector as a whole - is choosing a more risky position on the risk/return frontier in order to compensate for the loss of earnings. Once a downturn occurs, provisions as compared with profitability of lending would be a possible ex-post measure. Of course, such a measure needs to be employed carefully as financial deregulation would itself tend to be associated with some increase in risk. Also, unforeseen macroeconomic shocks may generate losses on loans even if spreads were adequate ex-ante.

Use of data on banks' size and cost structures are a third approach to examining excess capacity. It is particularly useful where entry to the sector is restricted, since in this case profitability data may be uninformative about excess capacity (in other words there may be "incipient" excess capacity). The dispersion of size in a competitive industry, for example, gives a view as to whether efficient and inefficient firm sizes coexist. In a cross country context, detailed aspects of the cost structure such as the scope of branching may offer complementary indicators although care is needed in selecting a "benchmark". It is also warranted to look at cost-income ratios generally as well as their dispersion for a given size of firm. This may indicate existence of excess capacity (accompanying X-inefficiency) even where entry is restricted. Note that given lags in adjustment of capacity, such cost

based measures may also provide helpful information for some time after competitive conditions prevail.

In the light of the above discussion, this section presents results of some empirical indicators of excess capacity. It is worthwhile to note briefly selected results and identified underlying factors for the US before going on to assess developments in the EU, both because the methodologies may usefully be used in an EU context and because the tendencies viewed in the past in the US may predict some of the difficulties likely to be faced in the EU.

2.2   Excess capacity in US banking; some evidence and underlying factors

Note that for both the US and European countries, the history of the banking system is in many ways rather similar. Before deregulation and liberalisation of financial markets, banks competed under conditions of low price competition under tight structural regulation (where there were entry barriers, artificial forms of market segmentation, price controls on deposits and quantity controls on loans). Under such conditions, banks tended to compete by providing 'free' services, and in 'extra' branches to collect deposits. Other consequences of low price competition (and increased supply of underpriced and cross-subsidised services) may have been high capacity in terms of employees and high salaries in the banking sector. In this way the rents (extraordinary profits) due to low competition would be eliminated, while nevertheless causing X-inefficiency in banking.

However, as a result of deregulation, securitisation and market integration these features were eliminated. The monopoly position and corresponding franchise of the banking industry were eroded. Fierce competition led to a narrowing of the interest margin, driven from both sides of the balance sheet. Such a change in competitive conditions certainly led to a need for adjustment to new market conditions. But indicators for more recent periods suggest that excess capacity remains.

In the US, Frydl (1993) notes that excess capacity is widely considered to have emerged in the financial services sector in the 1980s and 1990s. Following the suggestion in Section 1 to use a profit based measure of excess capacity once entry barriers are removed, a summary measure of this was the proportion of banks and of bank assets held by low earning banks, where low earning is defined as a return on total assets of five percent of the real Treasury bill rate (assuming own funds of 5%, capital should earn at least the same rate as such a risk-free asset). The use of a risk-free rate which varies over time with inflation and the stance of monetary policy rather than a fixed threshold may allow in a rough and ready manner for the likely cyclical nature of banks' profits.

This measure (see Chart 2) showed a marked rise over the 1980s, with the asset measure rising particularly strongly, suggesting problems for larger banks (reflecting, in effect, their delayed provisioning for ldc debt). Such a surmise is confirmed by separate examination for different size

classes of banks. Branching in the US also gave indications of excess capacity (Radecki 1993). In that country, the branch to population ratio showed no sign of falling over the 1980s[4], even though the deposit share of household financial wealth shrank. In terms of headquarters-based operations, transactions processing capacity was also seen as an area to reap scale economies and gains from consolidation.

As regards underlying factors, excess capacity in banking in the US was held to be the result of a variety of factors, notably (i) new competitors (ii) diversification on the part of households away from bank deposits (iii) adverse shifts in the macroeconomic environment (iv) errors in regulation and (v) agency conflicts between managers and shareholders. (i) and (ii) in particular may be anticipated in the EU in the future and hence are worth considering in detail. We now examine each of these for the US in turn:

New credit sources in the US competing against commercial banks included foreign banks, finance companies and direct credit markets. Foreign banks might be at an advantage if they faced a lower cost of funds or (prior to Basle) lighter capital regulation, and their entry could thereby lead to excess capacity for domestic banks. Finance companies could make inroads on banks' business especially in the area of lease finance, which was tax advantaged. And most crucially, direct credit markets were growing along with the expanding size and influence of institutional investors, reducing the cost of direct issuance of debt (and equity) on the part of firms. Commercial paper and junk bonds were considered to be particularly close substitutes for bank loans. Industrial and commercial companies also entered financial services in specific areas such as consumer loans. And financial innovation facilitating securitisation of claims increased further the comparative advantage of markets. Although banks still played a role in many of these developments (e.g. providing backup lines of credit), they were not able to profit as much as if the loans had remained on the balance sheet.

Banks also faced intense competition on the liabilities side, as institutionalisation took hold, leading to a sharp fall in deposits as a share of households' gross financial wealth. Money market mutual funds offered banks direct competition in offering liquid transactions balances. Previously, such liquid transactions balances had been a source of relatively cheap funds for banks. Yet more important, there was a shift in preferences to the longer end as life insurers and pension funds accounted for an increasing share of household assets. Given the ageing of the population, such shifts are likely to persist (see Davis 1995a, 1996).

Macroeconomic developments in the US were also unpropitious for banks, and may have aggravated excess capacity. Bank credit is by nature relational, and suited to immature businesses facing high credit risks. Monitoring is used to control credit risk. Market credit relies on reputation or collateral to

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4   More recent data are shown in Table 6

secure credit risk. High stable economic growth tends to help banks' share of business credit, since in such a situation a high share of credit demand comes from young growing firms of low reputation. Low economic growth favours ageing of companies, growing reputation and hence use of direct credit. Volatile growth will tend to lead to high bankruptcies of smaller firms, thus damaging bank assets disproportionately, given their focus on this type of borrower. The period since the first oil shock has seen low and volatile growth, in contrast to the preceding period of sustained high growth, which has implied a deterioration in the environment for banks.

In the US, undue increases in safety net protection combined with inadequate prudential supervision were also seen as leading to excess capacity, especially among large banks. The limit for deposit insurance was raised; 'brokered' deposits developed, packaging wholesale deposits so they were fully insured; the "too big to fail" doctrine[5] entered market perceptions with the rescue of Continental Illinois in 1984.

The particular vulnerability of large US banks to excess capacity in the later 1980s was noted above. While the late realisation of losses on ldc debt was a key factor in this, others, following the arguments made above, may include the intrusion of new competitors such as foreign banks and investment banks; large banks may have been operating in a region of diseconomies of scale in terms of lines of business, having been slow to gauge the fact that overall market conditions for bank credit would not support their large size; they may have made losses due to heightened risk-taking, given the moral hazard of 'too big to fail'; and the agency conflict between managers and shareholders may have been increased by the prevalence of syndicated loans, which tend to lead to a frontloading of managerial compensation (as big banks would organise the syndicate) but a back loading of credit risk (as they would also participate).

Interestingly, the US securities and insurance sectors were not seen to have faced the same excess capacity problems as banking. In securities, a high risk and high return sector with volatile earnings, excess capacity appears to be rapidly eliminated when it emerges. This is helped by rather low fixed costs. In insurance also no excess capacity is seen to have emerged. In both securities and in insurance, the costs of exit are relatively low compared to banking. Unlike in banking, there is no 'too big to fail' doctrine, as the collapse of Drexels showed, so liquidation can be an integral part of the elimination of excess capacity. Foreign entry did not affect capacity as directly as for banking. And there are no impediments to nation-wide operation, leading to a more efficient industrial structure than for banking.

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[5]   The case for "too big to fail" has to be made carefully, as it can be argued that the shareholders are still vulnerable in such cases. If banks did engage in excessively risky business, it may link rather to lack of control of managers by shareholders.

Meanwhile, there is some evidence in terms of the profitability of US banks since 1993, that suggests that the worst of the excess capacity has been eliminated.

2.3 Indicators of excess capacity in banking in EU countries

Based on the above considerations, and seeking to allow also for other aspects (such as technology) that shape banking, the section goes on to present indicators of potential excess capacity in EU Member States. In some cases, the corresponding results for the US are shown as an aide memoire. We employ data at both an aggregate and individual-bank level. The indicators do not separate various types of banking with varying functions and thus need to be interpreted cautiously[6], nor is any specific allowance made for the state of competition, although it is noted that some indicators are more suited to certain market situations than others. We conclude by focusing on the degree to which capacity has been rationalised.

2.3.1 Profitability of banks has tended to be low recently

Using aggregate data, Table 1a shows that viewed in a long term perspective, average profit margins in banking have tended to decline at least since the mid-1980s, according to OECD data provided in Davis (1997). Belgium, Denmark, France and Finland showed low returns on assets in 1990-94. Table 1b shows that there has also been an overall decline in returns on equity. Denmark, France and Sweden, and to a lesser extent Belgium, Spain and Austria show up in 1990-94, according to this measure. Meanwhile Table 2 indicates that share prices in the banking sector have lagged behind the overall index since 1980 (Belgium and the UK are the main exceptions). This is an a priori indicator that profitability has been below that which the market would require in the long term.

Table 3A follows the suggestion in Section 1 and the results for the US in Section 2.1 to use a profit-based measure of excess capacity. It was noted in Section 1 that profit-based measures are not appropriate when entry is restricted; however, for the period shown, 1989-95, such a measure is appropriate in most cases in the light of the deregulation of EU banking markets. A summary measure of this is the proportion of banks and of bank assets held by low earning banks, where low earning is defined as a return on total assets[7] of no more than five percent of the real money market rate (assuming own funds of 5%, capital should earn at least the same rate as such a risk-free asset; i.e. the benchmark rate is 0.05 * the real money market rate). The benchmark rates are shown in Table 3A.1.

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[6] It would be interesting to compare financial sectors of countries as a whole. See Appendix 2 for preliminary results of such an investigation.

[7] Note that such a measure may underestimate profitability for banks with low-risk assets, which require less capital than other banks. An alternative measure is provided below.

The data source for banks' balance sheets and profit and loss is IBCA, which implies that coverage of smaller banks may be incomplete, although most large banks should be included.

The analysis of Table 3.A.2 shows that for 1989-95, over 30% of banks earned less than the real money market rate (divided by 20) on their assets on average in Belgium, Denmark, France, the Netherlands and Finland. The figure is 20-30% for the remaining countries other than Italy and Portugal, where only a small proportion of the IBCA sample suffered from low profitability (bearing in mind that the benchmark varies between countries). This may of course link to rather recent timing of deregulation - and possible latent excess capacity - in these countries. The percentage of assets figures (Table 3.A.3) illustrate that the extent to which it is small or large banks that are afflicted by low profitability. On average, the asset figure exceeds that for numbers - indicating particular problems for large banks - in Denmark, Greece, France, Italy, Finland and the UK.

Table 3B shows similar calculations for the return on equity. This time the benchmark is the real money market rate itself. Arguably such a measure allows more sensitively than returns on assets for the differing profitability of balance sheet components (where otherwise a bank with many interbank assets will appear relatively unprofitable). Table 3.B.2 shows that similar results are obtained to those above. Over 1989-95 over 30% of banks earned less than the real money market rate on their capital in Belgium, Denmark and France and 20-30% in Ireland, the Netherlands, Sweden and the UK. As regards the results for assets, they are again consistent, except they show up less severely for the large banks in France.

On balance, according to these data, low profitability was a particular problem for the banking sector as a whole in Denmark, France and Finland. These averages over six years of course mask divergent behaviour within the period, which varies with the amplitude and timing of the economic cycle, for example, as well as with the benchmark itself. In many cases there was an improvement over time; the impact of banking crises in the Nordic countries and France is also apparent. Some deterioration over time is, moreover, apparent in countries such as Italy and Portugal, which may link to the fairly recent date of deregulation in those countries.

As outlined in BIS (1996), in the EU as in the US, underlying factors behind these profitability-based indicators of excess capacity include the quickening pace of innovation and the scope of deregulation, both of which have unleashed heightened competitive forces. Sources of financial capital have become more expensive, the cost of retail funds has risen; collateralisation of interbank and wholesale financing has spread, as shown by growth of repos; and institutional shareholders are more assertive in their dealings with management; regulators are alert to the need for banks to operate with adequate capital.

2.3.2 A risk based measure of excess capacity

Table 4 seeks to show whether banks have made sufficient interest income to cover the provisions considered necessary to cover loan losses. For 1994 and 1995, we indicate the percentage of banks which had provision/net interest ratios of over 50% and 100%, respectively. Clearly, the latter may be in danger of failure, depending on costs and other sources of income; the former may be an accurate indicator of the overall level of (uncovered) risks taken in the past. Caution is warranted, in that only a subset of the IBCA banks provide these data, and in some countries the overall sample is hence rather small. With this caveat in mind, the results do show some marked differences between EU countries. The proportion of banks with ratios of over 50% exceeds one in ten in Greece (in 1994), France, Austria, Portugal, Finland and Sweden. Notably in France, Finland and Sweden, severe difficulties of this nature are apparent, with provision/net interest ratios of over 100% for a number of banks.

2.3.3 Aspects of industry structure

In this section we focus on aspects of the structure of the industry which may give some evidence on overall capacity. This is of particular interest in an uncompetitive sector, as such capacity may become excessive and cause difficulties for profitability as competition intensifies. Table 5 seeks to follow the logic that excess capacity may be linked to insufficient exploitation of economies of scale. It was noted that $1 billion is often quoted as the minimum asset size needed to reap all available economies of scale in banking[8]. How important is the "tail" of small banks, in other words, and hence what scope could there be for consolidation in a more competitive environment - even if banks are viable in the current situation owing to "local monopoly power"? IBCA data are used to give the number of large banks (over $1 billion), while total numbers of institutions were taken from OECD or BIS data[9]. The number of small banks, both absolutely and as a percentage of the total, varies widely. In most cases, it is around 80%; exceptionally high ratios are seen in Finland and Austria, while it is particularly low in Greece and Portugal.

Table 6 provides supplementary information on overall banking structure, namely the ratio of population to number of institutions, branches, ATMs and employees in banking. As a memo item the population per sq.km is given (for example, it may be 'natural' that in a sparsely populated country more branches are needed than in a country with a highly populated country, to cover the same number of clients). Although such comparisons should be made with caution, given differing banking activities[10], regulations and customer preferences, they tentatively show whether capital and labour is

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[8]   In practice, the number could be rather higher, given the related research was undertaken some time ago, but we have left it at this level for the time being.

[9]   It is assumed that IBCA identifies accurately the number of large banks in each country, but does not provide detail for all small banks.

[10] Important differences relate for example whether or not banks are intermediating housing finance, to which extent the payment system of a country is based on bank giro or post giro system.

used more or less economically in providing similar services in a sector which shares a common technology. The insulation of EU banking sectors will of course break down with the advent of EMU, making such comparisons yet more relevant. These show that the average size of institution is largest relative to population in Greece, Portugal, the UK and Spain. Germany, Austria the US and Finland have many more small institutions. In terms of population per branch, Greece, Sweden, the UK and the US have the least branches, and Spain, Austria and Belgium the most.

The level of employment in banking relative to population is more even, with Sweden standing out the lowest employment given the population. Population per employee is relatively low in Denmark, Germany and Austria. Note in this context that employment may reflect not only excess capacity but alternatively a financial sector which is highly internationally competitive and heavily involved in export of banking services. Moreover, rough indicators of population per employee or branch might be somewhat misleading as measures of quality and efficiency of banking. There might, for example, have been the tendency to close the branches and cut the number of employees close to services to clients while at the same time the number of central administration or back office employees may not have been cut or their number may have even increased. Also staff may vary in terms of their flexibility and qualifications; overstaffing may be either alleviated or compounded by the structural composition of bank employees.

When assessing banking capacity, the size of the ATM network may also play a role. For Spain and Finland the network is dense. If a country has a dense network of ATMs and at the same time a dense network of branches and plenty of employees, that might signal overcapacity in distributing networks. On the other hand, ATMs may be a useful means of saving staff; inferences cannot hence be drawn solely from the ATM data. In fact, both Spain and Finland have average rather than high ratios of population to employees.

2.3.4 Cost-to-income ratio and its dispersion points to inefficiencies and/or excess capacity in particular in small banks

As noted, the rationale of looking at cost-to-income ratios and their dispersion as an indicator of relative excess capacity is based on the assumption that where there is no free entry into banking, banks may (continue to) have different types of X-inefficiencies and nevertheless remain in the market.[11] Or at least, deregulation is too recent to have had a major impact on behaviour. Firstly, we compare cost-efficiency on average across the Member States (see Table 7) to see whether there are differences between countries with regard to 'efficiency' as measured by the cost-to-income ratio[12].

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[11] Another possibility would be to examine cost-to-asset ratios as a rough measure of productivity.
[12] The cost-to-income ratio is calculated as a ratio of overheads (excluding depreciation) to the sum of net interest income and other operating income for non-consolidated banks.

Secondly, the cost-to-income ratios may also give some indication of unused economies of scale, if the ratio is higher for larger banks (and standard deviations are not too spread)[13]. Thus, the cost-to-income ratios in small, medium-size and large banks are compared across the Member States. Third, we look at standard deviations across size classes, a rough measure of X-inefficiency, albeit also linked to competition. Fourth, in Tables A1-A3 appended, we assess whether there has been progress i.e. whether the ratio has declined in level or dispersion during the recent years on average and for different size-classes of banks.

The data come from the IBCA database, which contains less banks in the beginning of 1990s than for the very recent years. This, and other issues related to this data base[14] should be kept in mind when looking at the time series results. Indeed, for this reason we focus mainly on results for the single year 1994 which gives the most comprehensive coverage. On the other hand, the database is at least harmonised with regard to concepts and contains the majority of banks assets of the respective countries so that the cost-to-income ratios based on samples (despite slightly time-varying sample size) should give quite a reliable picture of the developments. The majority (around 64 %) of the EU banks identified by IBCA are 'small', if the criterion for 'small' is taken to be total assets below 1 billion USD (see above). Only 23% are medium-size, i.e. total assets between 1 and 4 billion USD, and 13% of banks are 'large' with total assets more than 4 billion USD.

The results for 1994 are summarised in Table 7. Cost-income ratios of all banks varied between countries from 44% to 78%. Ratios of over 70% were present in Belgium, Greece, Spain, Italy, and Austria. In most countries the average cost-to- income ratio tends to decline slightly with the size of the bank, which would point to economies of scale. Nevertheless, the standard deviations are rather high so that this conclusion should be interpreted with caution. The average cost-income ratios for different sizes of banks are rather similar between the EU as a whole and the US.

As regards results disaggregated by size of institution, in Belgium, Greece, Spain, Italy and Austria the average cost-to-income ratio for small banks is clearly above the EU average of 67% in 1994, and in all of these countries it is above 70%. With regard to medium-size banks, the average cost-to-income ratio is above the EU average of 67% in 1994 in Belgium, Greece, Spain, France, Italy, Austria, Portugal and Finland, and above 70% in most of these countries. As regards large banks, the EU average is 62% in 1994. Belgium, Spain, France, Italy, Austria, and Finland are above average in this regard.

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[13] It should be noted that data do not allow differentiation of banks with branches and those without, which may have an impact on the potential for making use of economies of scale and scope.

[14] Medium-to-large sized institutions are disproportionately represented. The coverage (with regard to the number of banks) varies between 60 and 100% for the medium to large institutions in the majority of EU countries and between 25 and 40 % for small institutions. The coverage for small banks is limited for Austria, Portugal, Finland and Sweden (between 1 and 5 %).

We may interpret standard deviations of cost/income ratios as a measure of potential inefficiency albeit linked to competition, in the sense that the smaller the standard deviation the more intensive is the competition (forcing the banks to a similar/ 'optimal' cost-to-income structure). The data show that the standard deviation tends to be smaller either in medium-size banks or large banks compared to that in small banks. This may link to competition being less intense among small banks, which is in accordance with a general perception that they often benefit from local market power[15]. However, a complementary explanation is that there is potential excess capacity in these sectors with a high standard deviation. A third explanation, which may be relevant for some countries, is that there may be an 'arithmetic' element to the results, with a higher mean linking to a higher standard deviation. Subject to this caveat, we note that standard deviations among small banks are relatively high in Denmark, Greece, Spain, France and Austria.

It is also interesting to look at the various types of banks separately. Table 8 presents cost-to-income ratios for savings banks and commercial banks. For savings banks, the ratio seems to be above the EU average in Belgium, France, Italy and Finland, while for commercial banks Belgium, Germany, Greece, Spain, Italy and Austria show figures above the EU average. Interestingly, for France, Italy and United Kingdom, cost-income ratios are higher than average for all banks in their respective countries implying other banks have lower cost-income ratios than saving and commercial banks.

Considering the EU as a whole as compared to the US, the results for average cost-income ratios appear rather similar (with the average cost-to income ratio of medium size banks being slightly lower in the US). Smaller standard deviations within all size groups in the US may indicate more intensive competition compared to the average situation in Europe. Nevertheless, the ratios for savings banks and commercial banks seem to be above the respective ratios in the United States.

More detailed time-series results are shown in Tables A1-A5 appended. Compared to the situation of banks in the beginning of 1990s, the cost-to-income ratio of *small banks* in the whole EU has declined, i.e. on average the efficiency of small banks seems to have improved. The decline has been especially large in Belgium and Germany. Nevertheless, in some countries, such as Denmark, Greece, Spain, Portugal[16] and the UK, this ratio seems to have increased. In looking at the results, one should also observe that the standard deviation of the cost-to-income ratio is very high in several countries indicating that there are large differences among the banks and potential X-inefficiency. However, it is notable as compared to the US small banks, the European small banks on average do not differ significantly over time as well as in 1994.

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[15] It should also be noted that the analysis does not take into account the branches of large banks which are competing with small banks in local markets.

[16] A possible explanation of the increase in the cost-income ratio of Portuguese banks is connected with the expansion of branches and the arithmetic effect of a quick narrowing of intermediation margins. (See also footnote 12.)

With regard to *medium-size banks* (see Table A2), comparison to the situation in the beginning of the 1990s does not point to any major change on the average cost-income ratio of the whole EU. Whereas banks in Germany have made rather rapid progress in increasing efficiency in terms of declining cost-to-income ratio, in other countries the situation has improved only slightly or even worsened. With regard to US banks of the same size, which have improved in terms of cost-to-income ratio, the EU banks on average seem to be slightly less efficient in most recent years.

As to *large banks* (see Table A3), the decline in the cost-income ratio was rather sizeable in Belgium, whereas ratios in Finland[17] recorded sizeable increases. At an EU level despite the rising trend of the ratio the comparison with the US large banks shows that ratios were on average lower in EU throughout the 1989-95 period.

As to the cost-to-income ratio in small, medium-size and large savings banks (see Table A4), the ratio is on average lowest in large savings banks, and the same applies for commercial banks (see Table A5).

2.3.5 Some elimination of excess capacity has taken place

Tables 9-12[18] give an indication of the degree to which excess capacity has already been eliminated and by what means, again using aggregate data (cf. Section 1.3). They show that restructuring has proceeded in an uneven manner, which according to BIS (1996) links both to differing initial conditions -including the intensity of competition as well as banking market structures - and the strength of the obstacles to the required adjustment. Table 9 shows that there has been a fall in the number of institutions in all the EU countries shown since the 1980s (except for Belgium, where numbers peaked in 1992 and have fallen rather little since then). The number of institutions still differs enormously (and is even more out of line in the US), suggesting again that the number of small banks differs sharply between countries. Size concentration has not always tended to rise, however, as a consequence of restructuring. Only in Finland, the Netherlands, Spain and Sweden is there a clear upward trend in concentration, although concentration has also increased in Italy since 1990.

Branch networks have been cut back (Table 10), except in Italy and Spain, where branching restrictions have been lifted slowly or recently. In most cases, EU countries are ahead of the US in cutting back on branches. Table 11 shows that employment has fallen in most EU countries, and staff costs reduced as a percentage of gross income. But falls in employment are most marked in the UK and Finland (as well as in the US); in Germany and Italy employment is at a peak which in

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[17] This may be partly explained by the recent merger of the two largest commercial banks.
[18] Data were available for 9 countries only.

combination with high employment per head of population (Table 6) suggests a risk of excess capacity. This lack of adjustment may relate to the impact of employment protection legislation albeit also, especially in Italy, relatively weak competition at present. Table 12 indicates that the scope of restructuring via mergers and acquisitions is again highly uneven, with the UK, Spain and Italy (as well as the US) standing out somewhat.

As in the US, the differential patterns of restructuring, and the outturns, partly reflect the impact of public policy in the EU (BIS 1996). Notably, in the Nordic countries the authorities have actively promoted rationalisation of the banking industry following banking crises, which it can be argued were themselves partly a symptom of excess capacity following deregulation (Davis 1995b). On the other hand, some of the reasons for relatively slow adjustments in other EU countries may also link to public policy. One barrier to adjustment is the continuing public ownership of a wide range of financial institutions, which are much less amenable than private institutions to market signals. Mutual institutions may be subject to similar difficulties. Regulatory constraints on the take-over mechanism exist. There remains inflexibility in the labour market, which hinders restructuring of the financial services sector. Lack of disclosure on the part of banks still hinders the assessment of credit risk, as well as the operation of corporate control.

The next section discusses these policy issues in a more systematic manner.

3   Policy issues

3.1   Can market forces resolve excess capacity?

There are three ways by which an excess capacity problem can be resolved: productivity improvements, restructuring and exit.

Productivity improvements are most readily available to firms which were inefficient prior to the emergence of excess capacity, although in today's dynamic financial markets, new types of technological or organisational advance are also often readily at hand. In fact, banking sectors are quite commonly inefficient before deregulation, as witness the rationalisation of staff and branching that often occurs thereafter. Elimination may also involve removal of existing X-inefficiency, such as improved management practices and organisation of work. But such changes may not be readily or easily introduced, and may require changes of management to be effected.

Restructuring may entail changing the scale of the firm to a more efficient one, or changing the product mix. Whereas the former is by definition an option which is always available, losses made during periods of excess capacity may make the necessary adjustments more likely to occur. They may be difficult to achieve for firms which are too small to be fully efficient, as such firms may be

constrained in the availability of external finance for such a move. Shrinkage of large firms to a more efficient size is more readily achieved. On the other hand, sunk costs such as reputation may limit speeds of adjustment; if "pulling out" of certain areas is thought to weaken such reputation, for example.

In either case, achievement of scale economies may require <u>mergers and acquisitions</u> of other firms. This may reduce the problem of limits on external finance for small firms which wish to grow[19]. Mergers may also be a favoured way of achieving shrinkage to a more efficient scale. In banking, this may help to eliminate complex strategic forms of excess capacity such as competing branch networks, which the firms by themselves could not rationalise without becoming unviable. In other words, mergers may overcome what amount to elements of wasteful strategic competition among oligopolists. Mergers may also lead to changes in management structure that may facilitate aggressive pursuit of economies. (Issues relating to mergers are discussed further in Appendix 3).

<u>Exit of firms</u> is the third way to remove excess capacity. Mobility of capital (absence of "sunk costs" which cannot be recovered when leaving the industry) is essential to exit. If the industry is dominated by firms having immobile capital, excess capacity may persist. It was highlighted above that sunk costs may be more pervasive in banking than might appear at first blush.

One position, then, is that if we indeed proceed towards more competitive banking markets, the excess capacity that may have developed during past years in uncompetitive banking sectors should dry up by itself - through the routes noted above.[20] From the point of view of competition policy, such developments would be desirable, so long as they do not lead to such a degree of concentration as to threaten to cause a monopoly situation. Existence of excess capacity is an issue only to the extent that its elimination may prove disruptive, as in the case of banking, threatening to lead to systemic risk and affecting the economy as a whole. This suggests a need to be aware of the risk that a situation of excess capacity may be potentially unstable.

3.2   Speeds of adjustment of excess capacity

It is useful to continue by *assessing factors underlying differing speeds of adjustment of banking sectors to excess capacity*. Clearly, excess capacity needs to be reasonably long-lasting in order to raise policy concerns. According to the description in Section 1, the economic concept of excess capacity is a form of disequilibrium which requires a firm to make an adjustment, such as a change of

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[19]   Bearing in mind, however, that such small firms may have very immobile capital, leading them to persist in business even if making below-normal profits, as long as they are not actually losing money.

[20]   Another possible - if not entirely desirable - mechanism is the process whereby small banks find themselves unable to cope with costs of regulation (where these costs are not legitimately related to risk) and hence go out of business.

scale of production, of product mix or of productive efficiency. The adjustment is inevitable in the long run. But the speed of adjustment may depend on various factors, such as:

(i)   whether firms expect demand and the market price to rapidly return to the full capacity level, which would lead to a delay in adjustment in the hope of 'better times returning'. This may be typical of adjustment to recessions;

(ii)   costs of adjustment, such as the length of labour contracts and employment protection legislation;

(iii)   regulatory restrictions that may limit changes in the product mix, or even exit per se;

(iv)   the proportion of costs which are sunk (i.e. having a low recovery rate if the investment is unwound), which give an incentive to continue to operate in the short run even if normal profits are not being made (note that sunk costs in financial markets include not just fixed investments but also reputation, expertise and relationships developed over time);

(v)   pressures on management to maintain normal profits, which depend on the leverage which shareholders have over them;

(vi)   strategic interactions, such that banks which are in oligopolistic competition have no incentive to reduce capacity where rivals will benefit as much as themselves. This may lead to 'wars of attrition'.

As noted, (i) is typical of the response of any firm to a recession, while (ii) is also typically a feature of an entire economy. But (iii)-(vi) have particularly obvious applications to banking:

Regulation does limit the ability of banks to switch into new product areas, and to combine with non-financial companies. Regulators may also seek to restrict or delay exit from the industry, even in cases of financial distress if they consider that a failure of one bank may violate the credibility of the whole banking system. The safety net, if it offers protection without forms of oversight, may lead to incentives to take risks when losses are made, rather than exit from the industry ("betting the bank" or "gambling for resurrection" in the style of the US thrifts).

Sunk costs are arguably quite sizeable in retail banking, stemming from factors such as computer hardware and software specific to the institution in question, the branch network and, crucially, marketing expenditures on the deposit side and on the loan side, the corps of lending officers/customer relationships/knowledge about customers' creditworthiness. Note that these items are not all or predominantly, fixed capital per se. They also, as discussed below, have an impact on competitive conditions. They are arguably much less important in investment or wholesale banking. Also technological developments such as the advent of telephone banking and credit scoring techniques are significantly reducing the extent to which such sunk costs are also effective barriers to entry.

It is the case in any industry that the interests of managers and shareholders are not always well-aligned. Managers may pursue their own interests, for example pursuing growth oriented strategies which are not in the interests of shareholders. There are a number of reasons why shareholders have less control over management in banking than elsewhere, and hence banks may be less amenable to the operation of market forces than other industries. First there is the prevalence of public or mutual ownership of banks or implicit public guarantee (some banks may be 'too big to fail', deposit insurance system etc.). Second, there is the fact that banks' balance sheets, involving illiquid assets and complex offsetting exposures using marketable assets such as derivatives, are by nature less transparent than those of a typical firm, even for banks that are owned by private shareholders. It is for example, relatively costly to evaluate a loan portfolio given the private information the bank has about its clients - a problem that also militates against take-overs. Such problems may be aggravated by inadequate disclosure of banks' balance sheets and risk management practices, and/or lack of comparability of accounting methods across countries. Third, the operation of the take-over mechanism is often limited in the banking sector, partly by the ownership structure per se, but often also by regulation.

In the case of strategic interactions, the number of branches is an obvious area where oligopolistic banks build up large capacities (Dietsch 1994) and are unwilling to 'disarm' when competitive conditions change because their competitors would benefit disproportionately.

It is argued in BIS (1996) that these elements are sufficiently severe to bias the banking industry to permanent excess capacity even if there were no technological pressures.

3.3   Public policy issues

Public policy may then act to promote a more efficient industrial structure by lifting regulatory restrictions, facilitate mergers and/or reduce exit costs, while guarding against the danger that failures may be disruptive. In theory, they may also, as in the past, protect the industry from external competitors. But this implies not obtaining the full benefits of a competitive financial services sector, with a threat of "hidden excess capacity" and widespread X-inefficiency. We now outline the options, using examples from the US and the EU.

In the US, an obvious example of the lifting of restrictions is to completely eliminate restrictions on interstate banking, which would enable operators to realise economies of scale. Increased take-overs which would result could improve the market for corporate control, thus providing a stronger discipline on bank management to run banks efficiently. Geographical diversification would be facilitated, thus eliminating a major cause of excess capacity. However, in the EU this limitation does not apply, since the Single Market permits operation on a Single Passport across the EU as a whole.

Widening of banking powers into securities and insurance is a second potential way to improve a situation of excess capacity. It could enable economies of scope to be realised. The realisation of such economies requires use of an existing resource that is in excess supply. The branch network rather than the credit department or transactions processing capacity may be best suited to this function. Again, the EU is more liberalised in this respect, as in most countries the "universal banking" tradition enables banks to operate freely in a variety of business areas. This tradition was enshrined in the Single Market legislation. Universal banking as a flexible model with wide possibilities for exploiting economies of scope and maximal use of cumulating information from its many functions and counterparts may, indeed, prove to be rather crucial for survival strategies in European banking.

However, empirical evidence of scope economies is again uncertain, and increasing dissociation of financial services from branch distribution due to technological advances may lower the potential for realising economies of scope linked to joint production and distribution by branch networks. Moreover, efficiency might not be the only "raison d'être" of the universal bank as it may well - as a provider of multitude of services - enhance concentration in the financial sector[21]. Consequently, to guarantee market discipline, outside competition and threat of take-over are all the more crucial.

Ownership restrictions could be waived. At present there are limits to banks' holdings in non financial firms. However, lifting of such limits could be ill advised, as banks may not be best suited to realise efficiency gains in non-financial businesses given their lack of knowledge of these industries. Also industrial ownership of banks may lead to major conflicts of interest.

Policies to boost bank mergers may reduce excess capacity.[22] Two types of merger can be distinguished. Diversification mergers joins banks with different geographical balance sheet exposures, thus making the institution less vulnerable to localised economic problems. Such mergers should reduce the emergence of excess capacity. Consolidation mergers combine banks with competing operations. Benefits can be achieved by consolidating branch networks, consolidating transactions processing and by imposing superior management practices[23]. However, there are also scepticism as regards mergers, except those combining very small banks. For example Revell (1987) and Berger and Humphrey (1994) argue that in practice efficiency gains are proved to be rather negligible (see also Appendix 3). There is clearly a tradeoff at some point between mergers and

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[21] For benefits and costs of universal bank model and challenges for regulators (see for example Steinherr and Huvernees (1992)). They for example suggest incentives to restructure an 'ordinary' integrated universal banks into separate units under a holding company arguing that in this kind of organisation "risk management would improve, regulation were easier and conflicts of interests (resulting from a universal bank acting simultaneously as a supplier of savings services and an investor) were reduced".

[22] Not all mergers are equally desirable. "Defensive mergers" which involve buying a "local monopoly" to shelter rents, may not be viable in the long run.

[23] But the US literature is inconclusive as to whether such benefits have actually been achieved via merger to a greater extent than would have been the case if banks had not merged.

concentration, although this will be less threatening in the euro area than individual countries (depending on how important "local banking markets" are in EMU).

Following on from the discussion above, it is also important to provide shareholders with sufficient leverage over management to ensure policies which are contrary to their interests are not pursued. The government would clearly need to avoid artificial restrictions on take-overs. Privatisation of public banks and transformation of mutual banks to PLCs could increase the role of market forces[24]. For public and mutual banks may have less reason to pursue "shareholder value" or adequate returns on investment, thus heightening the risk of excess capacity. They may raise supervisory issues when they also benefit from an implicit public guarantee[25] (which may be the case for large institutions) or where small banks enter unfamiliar areas such as derivatives.

Meanwhile, better disclosure of information would enable shareholders better to evaluate policies being pursued by management and facilitate takeovers. And capital adequacy ratios must be maintained, to prevent it being in shareholders' interests to allow management to "bet the bank". In these respects, one may note that the EU has more public and mutual banks, a more restrictive approach to take-overs, less disclosure than in the US and less organised (and concentrated) institutional shareholders to impose discipline on management (for a discussion of the "corporate governance movement" in the US and EU see Davis (1995a)). On the other hand, a number of EU countries impose differential capital requirements on small banks to allow for risk, which can be helpful in removing excess capacity by encouraging small banks to merge.

Lowering of exit costs will address excess capacity by encouraging firms to leave the sector. It does not seem easy to lower the exit costs, as they are, to an extent , unavoidable, but regulators could strive to establish "neutral" or "normal" exit conditions. They should avoid, to the extent possible, regulatory incentives which keep banks alive artificially till a buyer can be found for the capacity (as might occur, for example, if the losses from liquidation are borne by the public sector). A requirement to close banks when capital reaches a certain low level may be helpful, as in the US. As a side effect, it should also reduce the tendency for capital to flow into banking in the first place.

A general point that could be made is that public policy should on the one hand allow market forces to operate, but on the other they should ensure the process is smooth and not disruptive. These may of

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[24]   On the other hand, arguments have been presented to preserve at least a public bank for competitive reasons in a local market, if the number of "core" banks is too small to maintain sufficient competition and efficiency. It is also argued that enhanced competition may sometimes lead to 'short-termism' as the profitability of banks is tested continuously, and thus worsen the financing of longer-term contracts. It has been argued that a public bank can mend these potential flaws of market mechanism under basically the same conditions as private banks just by its existence - as a threat. It may also be that the profitability requirement of public banks could be more long-term oriented, see Revell (1991).

[25]   This implies in turn a high credit rating and access to cheap funds.

course go in the same direction, for example if delay were to make the adjustment a sharper and more abrupt one. Supervisors may in this context need to ask about the business viability of banks and their profitability relative to a peer group, while recognising the danger of close involvement in business activities.

4 Conclusions

Despite conceptual problems in the measurement of excess capacity in banking, some indicators may nonetheless be derived and have been presented in this article for EU countries and the US. As noted, the potential existence of excess capacity raises policy implications to the extent that elimination of excess capacity may be a source of disruption of the financial sector and hence the economy as a whole. In this respect, appropriate regulatory policies related to mergers and take-overs as well as ownership of banking sectors are important to resolution of excess capacity problems, while nevertheless keeping in mind the danger of 'too much' concentration and ensuring removal of excess capacity is orderly. The perspective of EMU, which may well lead to a further intensification of competition, thus heightening the problem of redundant capacity, could increase the importance of orderly removal of capacity, although it may reduce concerns regarding the effect of concentration on competition.

APPENDIX 1 : ISSUES IN BANK OUTPUT MEASUREMENT

This section seeks to identify conceptual problems regarding bank output and how it may be measured. As is well known, the outputs of *primary and secondary* industries can be measured in terms of physical quantities or money values deflated by appropriate price indices (to allow for non-homogeneous outputs).[26] However, output in the form of *services* (including financial services) cannot be measured by physical quantities. Moreover, quality problems in measuring services output are acute - does for example a switch from corner shops to supermarkets show a loss in quality (convenience) or gain (variety of goods available). But the output of *financial institutions* presents particular difficulties. In the case of banks, as well as providing customers with low risk assets, credit and payments services, banks act as intermediaries in channelling funds from savers to borrowers and provide non-monetary services such as protection of valuables, accounting services and running of investment portfolios. Not all services are paid for directly ('free' services may offset zero interest on demand deposits). As pointed out by Kinsella (1980), each bank is a multi-product firm (posing a problem of aggregation of outputs); many of its services are joint or interdependent - providing one service may entail providing others which cannot be separated or priced separately (for example safekeeping and accounting services in a current account) or which it is cheaper to produce together than separately (economies of scope); and banking is subject to government regulations that may affect costs, prices or level or output.

At a practical level, the obvious starting point in measuring the sector's output is to look at the way it is treated in the *national accounts*. These accounts seek to measure the value added by different sectors of the economy, reflected in turn in the profits and income from employment arising in each sector. Profits normally exclude interest (or net interest) receipts on the basis that the latter represent transfers of earnings from activities in other sectors. If interest payments only represented such transfers, there would not be a problem. But the 'interest' received and paid by banks is in fact a combination of a charge for the use of capital and a charge for various services provided by these firms. The capital charge element nets out, at least when non-financial items in the balance sheet and the extent of any maturity transformation or risk absorption by financial intermediaries are taken into account. However, the exclusion of all interest received and paid leads to an understatement of financial firms' profits, in so far as the 'concealed' charges in net interest receipts are also excluded from output (typically only explicit service charges are counted). The understatement is so large that trading profits for the sector, as recorded, are invariably negative. It also leads to an understatement, rather than simply a redistribution, of GDP to the extent that the 'concealed' charges reflect services provided to final rather than intermediate consumers. In looking at the share of the sector in GDP, therefore, it is conventional to include net interest receipts in its valued added. [27] In the United States, these are attributed to depositors; in the United Kingdom, to both depositors and borrowers.

Most banking studies do not use national accounts measures, but instead have tended to adopt either the 'production' or the 'intermediation' approach; Kolari and Zardkoohi (1987) provide a detailed review of this literature. According to the *'production approach'*, banks are treated as firms which use capital and labour to produce different categories of deposit and loan accounts. Outputs are measured by the number of these accounts or number of transactions carried out on each type of product, which total costs are all operating costs used to produce these outputs. On the other hand, in the *'intermediation approach'*, banks are viewed as intermediators of financial services rather than producers of loan and deposit account services, and the values of loans and investments are used as output measure; labour and capital are inputs to this process, hence operating costs plus interest costs are the relevant cost measure. Deposits may be either inputs or outputs (see below).

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[26] Not that this is a straightforward calculation; for example, new products and quality charges make it difficult to calculate changes in output (or productivity) from a base year, particularly when working with volume as opposed to value series.

[27] Fixler and Zieschang (1991) suggest this measure can be rationalised in terms of a theory of financial firms grounded in a user cost of money concept.

The 'intermediation approach' was first used in early cost studies. For example, Alhadeff (1954) measured output in terms of dollar values of earning assets (loans plus investments). The disadvantage of this measure is that other assets, such as trust operations, are excluded, thus inflating the unit costs of larger banks. Schweiger and McGee (1961) and Gramley (1962) used total deposits and assets respectively to avoid this bias. However, all these studies used real-valued unweighted indices, which ignore the differential importance of individual bank products, the relative cost of production and the ease with which banks can alter their product mix. This highlights the additional problem of how to account for the multi-product nature of bank activity. Furthermore, production is a 'flow' concept expressed as some amount per unit of time, while the amount of assets and deposits are 'stock' concepts representing given amounts at a particular point in time. Moreover, it ignores services not proxied by balance sheet magnitudes. (It should be noted that many authors, such as Kinsella (1980) adopted these measures for want of better information.)

To correct for some of these problems, weighted indices have been used to measure output. A simple example would be Current Operating Revenue; however, Power (1969) suggested it would be better to use a weighted bank output index, including in output a 'charge' weight to each dollar of time deposits based on the difference between the Treasury Bill rate and the time deposit rate, to allow for services provided by the bank in accepting time deposits. Both these weighted measures assume there is no market failure or other distortion (higher loan rates obtained by one bank may imply market power or greater management efficiency and not higher output). This problem has led Greenbaum (1967) to use linear regressions to derive a set of average interest rates charged on various categories or earning assets by a sample of banks. These average rates were used as weights. But his measure was still vulnerable to the criticism of ignoring the effect of inflation on interest rates (which provides an unjustifiable boost to this measure of bank output). Moreover, non-credit output is generally treated crudely in the intermediation approach.

Meanwhile, the *'production'* approach of measuring numbers of accounts and transactions per period was first introduced by Benston (1965). This method meets some of the problems of the intermediation approach by removing the inflation bias and is a flow concept. It also allows numbers of accounts and average size of accounts to have differential effects on costs. But this approach suffers from lack of a method of weighting of the contribution of each service to total output, (especially given interdependence) and omits many important items of bank services. Later work by Benston *et al* (1982) weighted numbers of accounts in each activity area by proportionate shares in total operating costs using a Divisia Index, with a separate control provided by including the average size of accounts. The method is still vulnerable to the criticism of ignoring interest costs, which constitute a substantial proportion of banks' total costs. Omission is of particular importance if there is a tradeoff of higher operating costs (e.g. by operating many branches) against interest costs (because of greater locational convenience).

In *more recent studies*, the production approach has only been used by studies focusing on the relative efficiency of branches within a particular bank, rather than across banks[28]. Moreover, these studies have used the 'number of transactions' rather than 'number of accounts' on the basis that an account may be opened at one branch but transactions on the account may be processed at other branches.[29]

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[28] The Bank of Finland is currently analysing Finnish data on bank's transactions using the production approach. The very preliminary results tend to suggest that this approach using the numbers of transactions as output indicators leads to larger estimates of scale economies than the intermediation approach with static balance sheet figures as output indicators.

[29] For instance, Sherman and Gold's (1985) study of a US savings bank measured output as a weighted average of the 17 services most commonly offered by the branches; while Vassiloglou and Giolias (1990) took into consideration the complete range of 72 transactions offered by the Commercial Bank of Greece. Similarly, Tulkens (1990) aggregated 60 operations into 8 categories in his assessment of a Belgian public bank.

Besides intrinsic difficulties, the fact that the 'production approach' has not been used for interbank productivity studies reflects the difficulties encountered in collating accurate data.[30]

Given these data limitations, the latest bank productivity studies have adopted the 'intermediation approach'. More specifically, Elyasiani and Mehdian (1990 a and b) followed Mester (1987) and the early studies outlined above, in assuming that output should be measured as the dollar value of a banks' earning assets; while deposits, in addition to labour and capital, should be treated as inputs in the production of assets. In contrast, Field (1990) took a similar view to Powers (1969), in regarding deposits not as an input but as an additional product over which banks compete. Hence he chose to measure output as the value of loans and deposits. Other studies have refined this approach by making distinctions between different types of deposits. For instance, Rangan et al (1988) considered demand, time and savings deposits as outputs, while purchased funds such as large CDs, notes and debentures were regarded as inputs. Similarly, Berger and Humphrey (1990a) treated produced deposits (demand, retail time and savings accounts) as outputs, but considered purchased funds (federal funds, large CDs and foreign deposits) to be inputs. They explained that this differentiation is necessary because the latter are not highly resource consuming. More recently, Berg (1991) and Berg and Kim (1991) have argued that since purchased funds do not use real resources they do not even qualify as an input.

Berger and Humphrey (1990b) drew attention to the need, before making a decision on which method to use, to firstly identify which banking functions are most important for the purpose of the study being undertaken. They outlined three approaches to this initial identification process. Under the *asset approach*, banks are considered only as financial intermediaries between liability holders and those who receive bank funds, and bank outputs are considered to be just loans and other assets (see Sealey and Lindley (1977)). The *user cost approach* determines whether a financial product is an input or output on the basis of its net contribution to bank revenue. If the financial returns on an asset exceed the opportunity cost of funds or if the financial costs of a liability are less than the opportunity cost, then the instrument is considered to be a financial output (see Hancock (1985)). Under the *value added approach*, those factors having substantial value added are employed as important outputs (see Berger, Hanweck and Humphrey (1987)).

To summarise, therefore, these approaches have been distinguished. However, national income measures are little used in the academic literature; and at present the 'intermediation approach' appears to be preferred to the 'production approach' in interbank studies. In the light of Berg, Forsund and Jansen (1989), the choice between these two approaches needs to be carefully considered, since their study of the Norwegian banking market in 1985 found that the number and ranking of efficient banks varies significantly depending on which output measurement is used.

Additional comments

Risk is an additional feature of bank loans, but variations in it are not taken into account in most output measures; a bank may be able to boost output in terms of the balance sheet by increasing risk. Should output be 'sustainable' and hence discounted for risk? And should any account be taken of diversification? Note that revenue takes variations in *ex-ante* risk premia into account and hence output increases more if risk premia are increased than if they are not. Perhaps it might be more appropriate to use some *ex-post* revenue measure, covering losses over the cycle, with provisions as negative output. Alternatively, as suggested by Charnes *et al* (1990) provisions and actual loan losses could be counted as inputs. Note that in this connection, the national accounts measure counts all of the spread as depositor or lender services, with no return to risk bearing.

More generally, none of the identified measures of output seem to reflect the *quality of bank services* of which risk (of failure) is only one dimension. Other aspects include liquidity and security for

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[30] Comprehensive data are only available for the United States, and even this has questionable features (Elyasiani and Mehdian (1990a)).

deposits; maturity, covenants and secured status for loans. For example, in the United Kingdom there have been considerable changes in characteristics of deposits (interest-bearing current accounts, no notice on time deposits, cheque books with time deposits). Custom made products are common in securities markets. At least some of these can be objectively measured, perhaps using 'Hedonic price indices' (Deaton and Muellbauer (1980)), although integration into measures of output could be problematic (see Shaffer and David (1991) for an attempt to measure economies of scale using such techniques). Of course, the increase in explicit charging and 'unbundling' of financial services previously provided jointly makes output measurement easier.

Third, the various measures do not allow for intertemporal relationships that are crucial in banking. Rather than being only an implicit indicator of services provided, the interest rate might indicate an investment by the bank in a long-term relationship.

Fourth, what happens to measures of output when *competition* increases? If it narrows interest margins, it will reduce national income measures,[31] although if more loans are made, this may be partly offset. The production approach is unaffected unless more loan accounts are opened. The traditional intermediation approach shows a fall in output (higher interest costs) unless this is offset by a larger volume of loans.

It may be suggested that recent developments in the *theory of intermediation* may offer insights into bank output. The traditional theory of banking relates to economies of scale (Gurley and Shaw (1960)). But more recent studies have focused on information asymmetries between borrowers and lenders. These arise from the inability of investors to screen the quality of entrepreneurs and firms (Leland and Pyle (1977)) and to monitor their performance (Diamond (1984)). There may be economies of scale in monitoring making delegation of monitoring to banks desirable. Banks may have informational advantages arising from ongoing credit relationships; from access to the borrower's deposit history (Fama (1985)); and from use of transaction services (Lewis (1989)). If monitoring is the crucial activity of banks, should more account be taken of it in output measures? Is it a cost (required to provide services) or a service in itself? As with risk, is the best way of measuring it in terms of outturns, in that successful monitoring will reduce loan losses as a proportion of the balance sheet?

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[31] The more monopoly/oligopoly, the higher indicated output.

APPENDIX 2: COMPARING FINANCIAL SECTORS IN SELECTED COUNTRIES, SOME PROXIES OF EFFICIENCY IN FINANCIAL INTERMEDIATION

In addition to comparing efficiency of banking sectors whose tasks are rather different in various countries (for example, whether or not banks are intermediating housing finance, to what extent the payment system of a country is based on bank giro or post giro system), it may be useful to look at the whole financial sector across the countries. Nevertheless, data availability again is problematic.

One indicator might be the costs of the financial intermediation of the economy (as a percentage of GDP). Excluding countries with significant export of financial services, this ratio should be rather similar across countries and deviations from the best performer (lowest ratio) may give indication of potential inefficiencies (and overcapacity) - although other interpretations are possible. Table A.2.1 gives information on this ratio in Belgium, Denmark, Spain, Netherlands, Austria, Portugal, Finland and Sweden, which may be regarded as rather similar in that respect that none of them plays a major role in export of financial services. In the first part (I), the ratio is approximated by the contribution of financial institutions to GDP (reflecting mostly the net interest margin of financial institutions). The ratios are highest for Belgium, Austria and Portugal.

Table A.2.1: Contribution of financial institutions to GDP (I) and compensation to employees as a percentage of GDP (II) in selected Member States

	(I)		(II)	
	1985-89	1990-94	1985-89	1990-94
	%	%	%	%
Belgium	5.78	4.99	3.63	3.46 1)
Denmark	2.60	1.78	1.96	2.08 3)
Spain	3.05	3.86 1)	3.34	3.29 3)
The Netherlands	3.59	3.43	1.98	1.82
Austria	4.86	5.37	2.05	2.23
Portugal	5.83 2)	...	2.88 4)	...
Finland	2.94	2.94	1.75	1.73
Sweden	3.91	3.54	1.17	1.28

Source: OECD; 1) average of 1990-93, 2) average of 1986-89, 3) average of 1990-92, 4) average of 1986-88.

The above information is supported by part (II) of Table A.2.1, which shows that compensation paid to employees in financial institutions as a percentage of GDP is again highest in Belgium, Portugal and Austria, as well as in Spain.

APPENDIX 3: SOME ISSUES RAISED BY MERGERS AND TAKE-OVERS IN BANKING

In any industry, the main incentive for productive efficiency, i.e. to ensure production at minimum costs, is the threat of bankruptcy or/and an efficient market for corporate control (including the possibility of hostile take-overs). Nevertheless, in banking these conditions are often considered not to be fully satisfied (see Neven 1992). Consequently, deregulation of banking markets has also raised the issue to what extent the authorities should relax regulation, if any, in this field. In the following, the role of mergers is discussed in light of recent research from the point of view of authorities, in particular from the point of view of macroprudential supervision, but also from the point of view of competition policy.

It is concluded that whereas in principle market forces should be encouraged (by appropriate deregulation) to facilitate the necessary restructuring (for example getting rid of excess capacity) in the banking sector, caution may be warranted in the attitude of authorities towards mergers so as not to encourage concentration to the degree as to threaten to cause a monopoly situation or to bring about institutions that are "too big to fail". Although EMU may make banks less dependant on their traditional markets and enhance competition from outside, there will remain local and regional banking markets, where this caution may be warranted. It may even be that one should worry about concentration in banking more than in other sectors of economy, because banks still have a key position in allocating resources for investments and there still is - despite deregulation - a tendency of banking markets to be oligopolistic. Moreover, the benefits of increasing the size of banks are rather unclear in the light of empirical studies and past experience.

It is intuitively clear that in the discussion about mergers one should distinguish between mergers of smaller banks and mergers between so-called 'core banks', i.e. major banks competing relatively equally in their markets[32]. In the following we try to argue this point in more detail.

A.3.1 Are economies of scales and scope feasible? Are bigger banks more efficient?

The most common argument to motivate mergers is related to potential economies of scale and scope, i.e. to the hypothesis that bigger (and diversified) banks are more efficient. Benefits may be achieved by consolidating branch networks and transactions processing and by imposing superior management practices so as to get rid of excess capacity and to increase efficiency in general.

In the extreme, the existence of scale economies would lead to the question whether banking be regarded as a natural monopoly, where one bank could meet market needs at minimum average cost. This kind of situation occurs with a production technology featuring increasing economies of scale. In this case there would be a 'natural' tendency towards mergers and also the authorities should aim at encouraging them[33]. As pointed out in the main text, according to recent empirical research, however, the economies of scale or scope in retail banking are rather limited. Neither would research support the existence of a natural monopoly in banking (Dowd 1992). On the other hand, problems related to measurement and aggregation may make it very difficult to verify economies at least in certain functions.

It seems that desire to realise scale and scope economies can at best only explain part of mergers and that these benefits can by no means be arguments for a monopoly situation with one bank in the

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[32] In most countries concentration has led to markets where the 'core banks' can be recognised. Although it is difficult to define precisely these banks, they are normally of similar size and can be characterised as being crucial for the functioning of the financial system (market makers , major counterparts of central banks etc.), see Revell (1987).

[33] On the other hand, the natural monopoly produces less than the Pareto-optimal market equilibrium. To increase efficiency would nevertheless require regulation.

market. Moreover, there are inefficiencies among banks of all sizes and mergers as such do not make a merging bank efficient. This is evidenced by several studies on banking mergers in the US banking sector. For example, according to Berger and Humphrey (1992), mergers could in principle bring about rather significant operating cost savings, but in practice this has not always been the case due to the so-called X-inefficiency in management practices and organisation of work. Peristiani (1993) give similar results after having investigated the long-run profitability and operational efficiency of US banks that engaged in mergers during the 1980s by analysing the banks both before and after mergers. The results suggest that on average banks participating in certain types of mergers may realise some benefits in profitability or operating costs, if the surviving banks succeed in avoiding increases in non-performing loans and get rid of X-inefficiency. However, the results based on analysis of a control group suggest that mergers are not the sole means of lessening overcapacity, but banks can achieve the same end through internal cutbacks and reorganisation. At least one may conclude that mergers are a rather uncertain method of increasing efficiency in banking except for very small banks.

A.3.2 Other motivations for bigger banks. Is big really beautiful in banking? Will there be local banks in the EMU area?

Growing size of banks and mergers have accompanied growth of other organisations in the society. Are there reasons to believe that in the future a general increase in the size of banks is beneficial? As regards global banking, it is obvious that the size of a bank is important for example to service large customers. It is, however, rather unlikely that all banks of the EMU area could even through mergers reach such sizes as are required to compete in international markets or even in the whole EMU-area. It seems likely that regional banks will remain limited to a home-country or neighbouring countries or even to a smaller region, at least in the foreseeable future. Indeed, one may argue that as possibilities of big companies to finance their needs directly from domestic or foreign capital markets have improved and are likely to improve further in the EMU, it may well be that banks have increasingly to seek their markets in financing of small and medium sizes firms in local markets, where the required size of the bank from the point of view of risk taking is accordingly smaller. (Banks can also make use of innovations to serve financial needs of bigger companies, for example by participating syndicated loan arrangements.)

An argument for bigger banks may be related to the better ability to bear risk. Bigger banks can more easily diversify risks both as regards regions and various sectors of the economy. EU banking legislation itself to some extent encourages evolution towards bigger banks (limits to large risk exposures, incentives to employ sophisticated internal risk management models which require a certain scale to be economically viable). In this context, one should however, also consider the problem of banks becoming "too big to fail" (i.e. severe moral hazard arising); even though in a Euro-area or global markets a systemic risk may be reduced, it cannot be ignored. Moreover, the collapse of a big bank can have a very disruptive effect in local markets (at least in a foreseeable future) and cannot be neglected as a cause of concern for national supervisors.

A.3.3 Is concentration a case for caution?

The history of banking is also a history of mergers, which often have occurred in waves and been related to deregulation and/or financial crises. A merger has often been followed by another mergers in a "strategic" manner as competitors have regarded the resulting new bank to threaten their position in the market. Hence the objective of obtaining or maintaining market power cannot be neglected.

The ideal of perfect competition in banking is regarded as even more remote than in the real economy: it is generally agreed that criteria for perfect competition - large number of firms, homogeneous products, free entry and exit, transparency of markets and information - tend not to hold in banking. The theory of contestable markets (see Baumol 1982) saying that even the market with only few players can be competitive, if the threat of competition from outside is credible, may offer a model suitable to banking, in particular now that legal and regulatory limits to cross border financial flows are abolished and remote banking is more and more feasible. Nevertheless, it is generally agreed that

there still remain sunk costs, i.e. barriers to entry and exit from markets (see Vives 1990), so that the threat of outside competition is not always credible.

It may be argued that oligopolistic banking with only a few players may by nature be prone to concentration and co-operation because of the variety of its 'products'; deviation from an agreement on the market of one product can be punished by other counterparts of the agreement in the markets of other products. This may mean that one should worry about the concentration in banking more than in other sectors of economy, all the more so, because banks still have a central position in allocating resources for investments[34]. Competition authorities as well as regulators may hence need to focus on bank mergers. An interesting issue is whether EMU will sharply reduce barriers to market entry, thus reducing potential competitive concerns over mergers.

A.3.4 Conclusion

The above discussion may be concluded by suggesting that caution is warranted as regards mergers, in particularly among large 'core' banks. The economies of scale and scope of big mergers appear to be sparse, and may enhance concentration to the level that is problematic from the point of view of efficient allocation of resources. Moreover, they may bring about institutions which are 'too big to fail'. Indeed, the important underlying cause of banking mergers in the past have been to seek market power although the move to EMU may reduce this risk. For mergers between smaller banks the evidence is more favourable both as regards efficiency aspects as well as risk diversification.

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[34] Above it is implicitly assumed that price competition is always beneficial. Nevertheless, it is sometimes said that competition in banking may be excessive, and to the extent it is necessary to maintain the credibility and reputation, which are particularly important in banking, concentration should not be worrisome. Nevertheless, concentration may be regarded always as problematic, because there is no single, effective method to supervise monopolies or in general the misuse of market power.

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Table 1a: Profit before tax (% of average balance sheet total)

	79-84	85-89	90-94
All banks:			
Belgium	0.35	0.32	0.31
Germany	0.64	0.62	0.55
Spain	0.78	1.07	0.98
France		0.44	0.23
Italy		1.17	0.92
Netherlands	0.48	0.70	0.55
Austria		0.60	0.41
Portugal	0.44	0.59	1.09
Finland	0.32	0.40	-1.12
Arithmetic average	0.50	0.66	0.41
Commercial banks:			
Denmark	1.22	0.99	-0.17
Germany	0.53	0.73	0.55
Greece		0.46	1.20
Spain	0.69	1.09	0.98
France		0.31	0.06
Luxembourg	0.34	0.34	0.37
Finland	0.48	0.49	-1.06
Sweden	0.37	0.63	0.89
UK	0.88	0.84	0.66
Arithmetic average	0.64	0.65	0.39

Table 1b: Return on equity (%)

	79-84	85-89	90-94
All banks:			
Belgium	14.64	10.92	8.18
Germany	19.28	16.76	13.78
Spain	10.17	12.75	10.33
France		14.52	5.62
Italy		15.90	11.03
Netherlands	14.63	16.99	13.41
Austria		15.42	8.40
Portugal	15.55	14.11	16.62
Finland	5.55	6.28	-19.15
Arithmetic average	10.92	12.41	6.65
Commercial banks:			
Denmark	13.32	11.34	-2.61
Germany	13.35	15.84	10.60
Greece		14.65	26.55
Spain	8.77	12.34	9.72
France		13.48	1.95
Luxembourg	11.04	10.12	12.25
Finland	6.81	6.90	-17.97
Sweden	8.19	9.53	16.82
UK	22.00	16.28	15.68
Arithmetic average	11.29	11.73	7.34

Source: OECD

Table 2:   Long-term movements in bank share prices

Countries	1970	1980-82	1984-86	1990-92	1993-95	1995
	ratio of bank index to overall index, 1980=100					
Germany	93	94	83	75	78	72
Italy	..	138	96	86	72	67
United Kingdom	85	97	90	83	118	127
Belgium	110	97	92	88	107	112
Finland	85	98	84	47	22	15
Netherlands	..	92	77	56	61	60
Spain	56	112	78	85	76	72
Sweden	66	99	84	68	66	61
United States	142	111	120	69	92	96

Source: BIS;

Table 3A: A profitability-based measure of potential excess capacity using returns on assets (source: IBCA)

3.A.1 Benchmark for low earnings (equal to 0.05* real money market rate) percentage points

	BE	DK	DE	GR	ES	FR	IE	IT	NL	AT	PT	FI	SE	UK
1989	0.14	0.1	0.13	0.06	0.11	0.13	0.12	0.1	0.34	0.16	0.06	0.1	0.09	0.12
1990	0.14	0.21	0.16	0.04	0.11	0.15	0.17	0.1	0.18	0.14	0.06	0.11	0.07	0.09
1991	0.15	0.2	0.13	0.05	0.11	0.15	0.16	0.09	0.15	0.14	0.08	0.15	0.06	0.09
1992	0.19	0.27	0.09	0.06	0.13	0.22	0.2	0.13	0.15	0.12	0.09	0.23	0.25	0.1
1993	0.15	0.43	0.08	0.07	0.08	0.2	0.33	0.12	0.13	0.1	0.1	0.18	0.09	0.1
1994	0.12	0.16	0.1	0.12	0.1	0.18	0.12	0.11	0.09	0.09	0.11	0.24	0.16	0.12
1995	0.16	0.15	0.12	0.09	0.1	0.18	0.13	0.1	0.11	0.1	0.12	0.29	0.15	0.12
Average	0.15	0.22	0.12	0.07	0.11	0.17	0.18	0.11	0.16	0.12	0.09	0.19	0.12	0.11

3.A.2   Percentage of banks having returns on assets below the benchmark

	BE	DK	DE	GR	ES	FR	IE	IT	NL	AT	PT	FI	SE	UK
1989	21.1	33.3	32.8	21.4	73.6	24.1		3.9	69.2	30.0	0.0	20.0	0.0	23.9
1990	32.4	53.6	40.2	21.4	46.3	37.5		3.1	64.3	20.9	0.0	40.0	0.0	20.0
1991	29.0	28.1	29.4	23.5	10.7	34.8	0.0	5.9	28.6	21.7	8.0	66.7	50.0	21.3
1992	42.1	55.0	16.6	20.0	9.7	47.9	33.3	13.5	28.6	21.5	21.4	83.3	45.5	19.4
1993	27.0	18.1	8.8	31.8	15.3	39.7	45.5	11.7	38.1	15.4	19.4	70.0	50.0	24.2
1994	27.9	24.7	14.7	27.3	22.5	43.3	30.0	23.8	14.3	15.4	15.2	72.7	35.0	31.3
1995	33.7	2.2	11.3	23.8	15.8	40.4	23.8	14.3	9.8	15.2	15.6	70.0	15.0	27.8
Average	30.4	30.7	22.0	24.2	27.7	38.2	26.5	10.9	36.1	20.0	11.4	60.4	27.9	24.0

3.A.3   Percentage of bank assets held by banks having returns on assets below the benchmark

	BE	DK	DE	GR	ES	FR	IE	IT	NL	AT	PT	FI	SE	UK
1989	23.7	89.6	18.0	54.2	28.2	15.7		12.7	94.5	22.8	0.0	21.5	0.0	25.2
1990	21.5	92.8	40.8	53.2	13.2	25.8		12.4	41.9	15.9	0.0	45.9	0.0	15.0
1991	23.9	63.6	22.5	6.6	4.3	25.1	0.0	11.9	11.6	10.8	0.8	79.2	57.3	40.0
1992	38.8	94.0	16.7	14.7	2.6	60.3	3.8	22.1	14.5	6.4	13.6	87.7	22.6	51.7
1993	21.7	68.7	11.4	30.1	12.0	62.7	79.8	22.7	15.5	4.1	9.5	87.7	54.0	45.9
1994	6.8	55.6	14.3	23.0	14.0	61.8	20.5	34.2	6.6	4.1	3.8	88.3	15.7	56.0
1995	11.8	0.3	17.9	8.4	17.8	51.4	15.3	21.8	6.4	2.4	4.6	91.9	8.1	48.3
Average	21.2	66.3	20.2	27.2	13.2	43.3	23.9	19.7	27.3	9.5	4.6	71.7	22.5	40.3

Table 3B: A profitability-based measure of potential excess capacity using returns on equity (source: IBCA)

3.B.1 Benchmark for low earning (equal to real money market rate) percentage points

	BE	DK	DE	GR	ES	FR	IE	IT	NL	AT	PT	FI	SE	UK
1989	2.80	2.00	2.60	1.20	2.20	2.60	2.40	2.00	6.80	3.20	1.20	2.00	1.80	2.40
1990	2.80	4.20	3.20	0.80	2.20	3.00	3.40	2.00	3.60	2.80	1.20	2.20	1.40	1.80
1991	3.00	4.00	2.60	1.00	2.20	3.00	3.20	1.80	3.00	2.80	1.60	3.00	1.20	1.80
1992	3.80	5.40	1.80	1.20	2.60	4.40	4.00	2.60	3.00	2.40	1.80	4.60	5.00	2.00
1993	3.00	8.60	1.60	1.40	1.60	4.00	6.60	2.40	2.60	2.00	2.00	3.60	1.80	2.00
1994	2.40	3.20	2.00	2.40	2.00	3.60	2.40	2.20	1.80	1.80	2.20	4.80	3.20	2.40
1995	3.20	3.00	2.40	1.80	2.00	3.60	2.60	2.00	2.20	2.00	2.40	5.80	3.00	2.40
Average	3.00	4.34	2.31	1.40	2.11	3.46	3.51	2.14	3.29	2.43	1.77	3.71	2.49	2.11

3.B.2 Percentage of banks having returns on equity below the benchmark

	BE	DK	DE	GR	ES	FR	IE	IT	NL	AT	PT	FI	SE	UK
1989	23.68	40.74	25.81	21.43	73.55	26.05	0.00	3.85	61.54	21.95	6.67	20.00	0.00	23.91
1990	21.62	57.14	32.67	21.43	46.27	34.57	0.00	3.05	42.86	17.07	4.55	40.00	0.00	20.00
1991	26.32	38.97	26.25	23.53	12.16	33.33	33.33	7.60	21.43	17.02	8.00	66.67	37.50	22.95
1992	42.11	77.11	17.84	25.00	12.58	44.61	42.86	10.81	28.57	22.73	17.86	83.33	27.27	26.61
1993	35.35	38.30	9.31	31.82	17.11	41.98	61.54	8.52	28.13	10.96	25.81	70.00	43.75	28.89
1994	30.77	36.56	13.02	27.27	25.99	44.86	40.00	31.85	15.91	19.77	26.47	75.00	27.27	36.45
1995	34.65	2.17	11.79	23.81	22.22	42.42	30.43	18.75	6.98	17.05	24.24	81.82	12.50	34.10
Average	30.64	41.57	19.53	24.90	29.98	38.26	29.74	12.06	29.34	18.08	16.23	62.40	21.19	27.56

3.B.3 Percentage of bank assets held by banks having returns on equity below the benchmark

	BE	DK	DE	GR	ES	FR	IE	IT	NL	AT	PT	FI	SE	UK
1989	23.11	90.05	6.91	54.16	28.17	9.72	0.00	9.13	39.64	10.81	1.26	21.45	0.00	25.22
1990	6.01	92.88	14.28	53.24	13.18	12.60	0.00	0.76	13.38	5.87	0.56	45.85	0.00	15.00
1991	7.41	65.13	11.45	6.59	4.45	11.85	8.78	8.95	6.55	2.15	0.82	79.15	52.78	40.02
1992	37.58	96.92	12.10	15.00	2.97	35.75	8.64	21.58	8.80	5.64	5.94	87.74	17.66	52.24
1993	6.37	17.77	8.83	30.07	8.85	39.54	87.57	24.50	3.74	1.23	12.54	87.72	53.48	47.41
1994	3.99	30.12	7.82	23.00	6.98	43.28	50.47	53.81	0.91	10.92	5.02	97.98	13.39	56.45
1995	9.33	0.08	6.02	8.41	18.89	40.91	44.43	23.41	0.94	2.99	5.88	99.22	8.14	44.75
Average	13.40	56.14	9.63	27.21	11.93	27.66	28.55	20.31	10.57	5.66	4.58	74.16	20.78	40.16

Table 4   Percentage of banks with loan loss provision/net interest ratios of over 50% and 100%

		Over 50%	Over 100%	Memo: banks in the sample
Belgium	1994	4	0	74
	1995	6	4	73
Denmark	1994	5	1	88
	1995	1	0	85
Germany	1994	3	1	1692
	1995	2	1	1403
Greece	1994	19	6	16
	1995	6	6	17
Spain	1994	8	2	144
	1995	6	1	136
France	1994	20	11	368
	1995	16	9	323
Ireland	1994	0	0	3
	1995	0	0	3
Italy	1994	7	1	284
	1995	8	2	234
Netherlands	1994	4	0	22
	1995	0	0	17
Austria	1994	23	6	52
	1995	15	4	75
Portugal	1994	16	3	30
	1995	10	0	29
Finland	1994	42	42	7
	1995	25	12	8
Sweden	1994	29	12	17
	1995	13	7	15
United Kingdom	1994	5	3	66
	1995	5	2	58

Source: IBCA

Table 5   Indicators of economies of scale in EU-banking sectors (1995)

	Banks with assets of under $ 1 billion	
	percentage of total	number
Belgium	74%	111
Denmark	85%	96
Germany	87%	3035
Greece	57%	10
Spain	71%	226
France	65%	384
Ireland	n/a	11
Italy	87%	814
Netherlands	88%	154
Austria	96%	1013
Portugal	52%	24
Finland	98%	345
Sweden	86%	96
United Kingdom	90%	504

Source: (left column: IBCA for large banks, OECD/BIS for total)

Table 6:   Indicators of banking capacity

	Population per institution	Population per branch	Population per employee	Population per ATM/cash dispenser	Population density per sq.km
Belgium	67,333	1315	133	2778	352
Denmark	46,044	2381	112	4830	121
Germany	23,400	1719[1]	108	2283	229
Greece	584,105	4545	260	7757	79
Spain	123,270	1190	168	1468	78
France	97,800	2272	142	2544	106
Ireland	61,661	3100	175	3891	51
Italy	60,786	2326	159	2695	190
Netherlands	89,080	2325	138	2816	379
Austria	7,626	1402	106	2380	96
Portugal	212,704	2778	162	2688	107
Finland	14,488	2632	159	1123	15
Sweden	78,571	3448	204	3759	20
United Kingdom	104,285	3572	144	2793	239
United States	11,025	3778	139	2143	28

Source: BIS, National data (Sub-Group on Banking Developments), OECD. 1) Excluding Deutsche Postbank.

Table 7:   Cost-to-income ratio in small, medium and large banks in 1994 (%)

1994		Small	Medium	Large	All
Belgium	Average	76	71	70	74
	Standard deviation	21	23	35	24
Denmark	Average	65	61	37	62
	Standard deviation	45	30	22	43
Germany	Average	66	61	50	64
	Standard deviation	28	19	26	27
Greece	Average	88	82	56	77
	Standard deviation	40	41	37	73
Spain	Average	72	71	65	71
	Standard deviation	113	24	23	79
France	Average	69	69	75	71
	Standard deviation	50	44	35	46
Ireland	Average	38	54	N/A	44
	Standard deviation	28	23	N/A	24
Italy	Average	76	75	77	76
	Standard deviation	15	23	38	23
Netherlands	Average	70	49	30	60
	Standard deviation	25	28	24	28
Austria	Average	83	74	74	78
	Standard deviation	55	14	8	38
Portugal	Average	57	72	59	63
	Standard deviation	19	26	10	19
Finland	Average	68	99	111	60
	Standard deviation	13	N/A	61	83
Sweden	Average	49	48	45	48
	Standard deviation	16	25	23	20
United Kingdom	Average	62	53	61	59
	Standard deviation	28	72	49	43
EU	Average	67	67	62	65
	Standard deviation	28	16	16	22
United States	Average	66	62	62	64
	Standard deviation	23	13	14	15

Source: IBCA database. *Small* banks have assets of below $1 billion,
medium $1-4 billion, and *large* over $4 billion

Table 8 **Cost-to-income ratio in**

savings banks and commercial banks in 1994 (%)

1994		Savings banks	Commercial banks	All banks
Belgium	Average	71	71	74
	Standard deviation	25	25	24
Denmark	Average	56	56	62
	Standard deviation	7	7	43
Germany	Average	60	60	64
	Standard deviation	8	8	27
Greece	Average	N/A	N/A*	77
	Standard deviation	N/A	N/A	73
Spain	Average	66	66	71
	Standard deviation	10	10	79
France	Average	91	91	71
	Standard deviation	11	11	46
Ireland	Average	71	71*	44
	Standard deviation	1	1	24
Italy	Average	79	79	76
	Standard deviation	9	9	23
Netherlands	Average	65	65*	60
	Standard deviation	18	18	28
Austria	Average	70	70	78
	Standard deviation	6	6	38
Portugal	Average	55	55*	63
	Standard deviation	16	16	19
Finland	Average	99	99*	60
	Standard deviation	N/A	N/A	83
Sweden	Average	60	60*	48
	Standard deviation	N/A	N/A	20
United Kingdom	Average	71	71*	59
	Standard deviation	N/A	N/A	43
EU	Average	70	70	65
	Standard deviation	7	7	22
United States	Average	62	62	64
	Standard deviation	26	26	15

*Only 3 or less banks are included in a group
Source: IBCA database and EMI calculations.

Table 9: Banks' restructuring: number of institutions and size concentration

Countries	Number of institutions						Concentration:		
	1980	1990	1995	Peak (since 1980)			1980	1990	1995
	number				year	%	percentage share		
Germany	5,355	4,180	3,487	5,355	1980	-35	..	..	17
France	1,033	786	593	1,033	1984	-43	57	52	47
Italy	1,071	1,067	941	1,109	1987	-15	26	24	29
UK	796	665	560	796	1983	-30	63	58	57
Austria	1595	1210	1041	-	-	-	-	-	-
Belgium	148	129	150	163	1992	-8	64	58	59
Finland	631	498	352	631	1985	-44	63	65	74
Netherlands	200	180	174	200	1980	-13	73	77	81
Spain	357	327	318	378	1982	-16	38	38	49
Sweden	598	498	112	598	1980	-81	64	70	86
United States	35,875	27,864	23,854	35,875	1980	-34	9 (14)	9 (15)	13

Source: BIS

Table 10: Banks' restructuring: number of branches

Countries	1980	1990	1995	Peak		
	number (in thousands)				year	% change
Germany	39.3	39.8	37.9	40.0	1985	-5
France	24.3	25.7	25.5	25.9	1987	-2
Italy	12.2	17.7	23.9	23.9	1995	-
United Kingdom	20.4	19.0	16.6	21.2	1985	-22
Austria	3.4	4.5	4.7	-	-	-
Belgium	7.80	8.3	7.8	8.5	1989	-8
Finland	3.4	3.3	2.1	3.5	1988	-39
Netherlands	6.6	8.0	7.3	8.5	1986	-14
Spain	25.8	35.2	36.0	36.0	1995	-
Sweden	3.7	3.3	2.7	3.7	1980	-27
United States	58.3	67.7	69.6	69.6	1994	-

Source: BIS

Table 11: Banks' restructuring: employment and staff costs

Countries	Employment						Staff costs		
	1980	1990	1994	Peak			1980 -82	1986- 88	1992- 94
	number (in thousands)				year	% change	as a percentage of gross income		
Germany	533	621	658	658	1994	-	48	44	39
France	399	399	382	401	1988	-5	47	44	44
Italy	277	324	332	333	1993	-0.3	46	48	44
UK	324	425	368	430	1989	-15	47	38	36
Austria	59	76	76	79	1995	-	-	-	-
Belgium	68	79	76	79	1990	-5	41	33	34
Finland	42	50	36	53	1989	-32	43	33	24
Netherlands	113	118	112	119	1991	-6	42	41	38
Spain	252	252	245	256	1991	-4	47	43	37
Sweden	39	45	42	46	1991	-5	29	23	22
United States	1900	1979	1891	2136	1987	-12	36	31	27

Source: BIS

Table 12: Merger and acquisition activity in banking

Countries	Number				Value							
					in billions of US dollars				as a percentage of all mergers and acquisitions			
	1989 -90	1991 -92	1993 -94	1995 -96	1989 -90	1991 -92	1993 -94	199 5-96	1989 -90	1991 -92	1993 -94	1995- 96
Germany	19	71	83	27	1.1	3.5	1.9	0.7	4.5	6.5	7.6	3.5
France	52	133	71	43	2.7	2.4	0.5	3.2	5.1	4.3	1.0	10.4
Italy	41	122	105	65	8.2	5.3	6.1	3.0	22.7	15.6	17.7	19.7
UK	86	71	40	28	6.4	7.5	3.3	21.7	2.6	6.5	3.4	12.4
Belgium	11	22	18	12	0.0	1.0	0.6	0.4	0.2	14.1	7.0	7.9
Finland	6	51	16	4	0.4	0.9	1.0	0.8	13.9	22.3	21.7	11.3
Netherlands	12	20	13	7	10.9	0.1	0.1	0.8	56.3	0.2	0.5	9.5
Spain	30	76	44	26	4.0	4.3	4.5	2.1	18.5	13.5	21.5	34.1
Sweden	10	38	23	8	2.0	1.1	0.4	0.1	8.8	3.8	2.0	0.4
United States	1501	1354	1477	1176	37.8	56.8	55.3	82.5	7.3	18.7	9.0	13.5

Source: BIS

Table A1   **Cost-to-income ratio for small banks**
(%) (less than 1 billion US$) in the EU

		1989-1991	1992-1995
Belgium	Average	97	72
	Standard deviation	49	27
Denmark	Average	58	65
	Standard deviation	8	27
Germany	Average	95	68
	Standard deviation	69	30
Greece	Average	72	81
	Standard deviation	74	32
Spain	Average	66	74
	Standard deviation	52	84
France	Average	80	67
	Standard deviation	62	60
Ireland	Average	N/A	37
	Standard deviation	N/A	28
Italy	Average	68	67
	Standard deviation	15	38
Netherlands	Average	80	65
	Standard deviation	43	23
Austria	Average	89	80
	Standard deviation	77	47
Portugal	Average	50	57
	Standard deviation	30	22
Finland	Average	N/A	64
	Standard deviation	N/A	14
Sweden	Average	75	64
	Standard deviation	8	19
United Kingdom	Average	57	59
	Standard deviation	18	24
EU	Average	74	66
	Standard deviation	32	23
United States	Average	72	67
	Standard deviation	21	21

Source: IBCA database

**Table A2 Cost-to-income ratio in medium banks
(1 to 4 billion US$) in the EU**

		1989-1991	1992-1995
Belgium	Average	78	76
	Standard deviation	25	22
Denmark	Average	75	62
	Standard deviation	7	34
Germany	Average	78	63
	Standard deviation	47	17
Greece	Average	41	80
	Standard deviation	32	35
Spain	Average	61	68
	Standard deviation	15	20
France	Average	78	68
	Standard deviation	33	44
Ireland	Average	75	60
	Standard deviation	N/A	20
Italy	Average	64	67
	Standard deviation	11	17
Netherlands	Average	37	42
	Standard deviation	16	22
Austria	Average	73	72
	Standard deviation	16	13
Portugal	Average	51	69
	Standard deviation	18	27
Finland	Average	100	99
	Standard deviation	N/A	30
Sweden	Average	N/A	47
	Standard deviation	N/A	21
United Kingdom	Average	56	46
	Standard deviation	16	36
EU	Average	64	66
	Standard deviation	13	13
United States	Average	65	63
	Standard deviation	15	15

Source: IBCA database.

Table A3   Cost-to-income ratio in large banks
(more than 4 billion US$) in the EU

		1989-1991	1992-1995
Belgium	Average	83	64
	Standard deviation	23	42
Denmark	Average	30	39
	Standard deviation	19	22
Germany	Average	60	53
	Standard deviation	26	21
Greece	Average	55	57
	Standard deviation	37	54
Spain	Average	57	62
	Standard deviation	14	19
France	Average	62	72
	Standard deviation	67	36
Ireland	Average	N/A	22
	Standard deviation	N/A	N/A
Italy	Average	60	66
	Standard deviation	19	23
Netherlands	Average	28	27
	Standard deviation	32	19
Austria	Average	69	72
	Standard deviation	8	8
Portugal	Average	47	57
	Standard deviation	15	12
Finland	Average	83	130
	Standard deviation	19	113
Sweden	Average	41	45
	Standard deviation	23	21
United Kingdom	Average	50	67
	Standard deviation	9	51
EU	Average	56	62
	Standard deviation	20	39
United States	Average	66	63
	Standard deviation	14	15

Source: IBCA database

Table A4 **Cost-to-income ratio in small, medium
and large savings banks in 1994 (%)**

1994		Small	Medium	Large	All
Belgium	Average	63	88	77	71
	Standard deviation	30	3	7	25
Denmark	Average	56	58	57	56
	Standard deviation	8	N/A	N/A	7
Germany	Average	61	59	58	60
	Standard deviation	8	7	10	8
Greece*	Average	N/A	N/A	N/A	N/A
	Standard deviation	N/A	N/A	N/A	N/A
Spain	Average	67	65	67	66
	Standard deviation	11	9	12	10
France	Average	114	89	91	91
	Standard deviation	N/A	13	9	11
Ireland*	Average	71	70	N/A	71
	Standard deviation	N/A	N/A	N/A	1
Italy	Average	81	78	80	79
	Standard deviation	8	8	15	9
Netherlands*	Average	72	N/A	N/A	65
	Standard deviation	9	N/A	N/A	18
Austria	Average	66	70	73	70
	Standard deviation	7	7	3	6
Portugal*	Average	N/A	66	43	55
	Standard deviation	N/A	N/A	N/A	16
Finland*	Average	N/A	99	N/A	99
	Standard deviation	N/A	N/A	N/A	N/A
Sweden*	Average	N/A	N/A	60	60
	Standard deviation	N/A	N/A	N/A	N/A
United Kingdom*	Average	71	N/A	N/A	71
	Standard deviation	N/A	N/A	N/A	N/A
EU	Average	72	74	67	70
	Standard deviation	8	3	4	7
United States	Average	73	57	55	62
	Standard deviation	33	17	28	26

Source: IBCA database and EMI calculations. *Small* banks have assets of below
$1 billion, *medium* $1-4 Billion, and *large* over $4 billion.
*Only 3 or less banks are included.

Table A5 **Cost-to-income ratio in small, medium and large commercial banks in 1994 (%)**

1994		Small	Medium	Large	All
Belgium	Average	63	88	77	71
	Standard deviation	30	3	7	25
Denmark	Average	56	58	57	56
	Standard deviation	8	N/A	N/A	7
Germany	Average	61	59	58	60
	Standard deviation	8	7	10	8
Greece	Average	N/A	N/A	N/A	N/A
	Standard deviation	N/A	N/A	N/A	N/A
Spain	Average	67	65	67	66
	Standard deviation	11	9	12	10
France	Average	114	89	91	91
	Standard deviation	N/A	13	9	11
Ireland	Average	71	70	N/A	71
	Standard deviation	N/A	N/A	N/A	1
Italy	Average	81	78	80	79
	Standard deviation	8	8	15	9
Netherlands	Average	72	N/A	N/A	65
	Standard deviation	9	N/A	N/A	18
Austria	Average	66	70	73	70
	Standard deviation	7	7	3	6
Portugal	Average	N/A	66	43	55
	Standard deviation	N/A	N/A	N/A	16
Finland	Average	N/A	99	N/A	99
	Standard deviation	N/A	N/A	N/A	N/A
Sweden	Average	N/A	N/A	60	60
	Standard deviation	N/A	N/A	N/A	N/A
United Kingdom	Average	71	N/A	N/A	71
	Standard deviation	N/A	N/A	N/A	N/A
EU	Average	72	74	67	70
	Standard deviation	8	3	4	7
United States	Average	73	57	55	62
	Standard deviation	33	17	28	26

Source: IBCA database and EMI calculations. *Small* banks have assets of below $1 billion, *medium* $1-4 Billion, and *large* over $4 billion.
*Only 3 or less banks are included.