

REPERCUSSIONS OF BANKING CONCENTRATION ON STABILITY AND COMPETITION WITHIN THE FINANCIAL SECTOR: A LITERATURE REVIEW

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1 This section draws upon: CARLETTI ELENA and HARTMANN PHILIP, *Competition and stability. What is special about banking?*, cit., pgs. 11-19.

Mergers are, in general terms, any substantial acquisition of the assets or stock of another firm, normally involving a process through which two entities become a single one². The purpose of this paper is to describe the effects of such operations on competition and stability in the banking sector. In this sense, section one reviews the theoretical and empirical literature regarding the incidence of bank mergers on loan rates, quantities lent to small businesses and retail deposit markets (variables deemed as competition indicators). Correlatively, section two describes the different postures related to the stability outcomes of bank consolidation. Section three sketches out the administrative or institutional consequences of the stability and competition concerns related to concentration within the financial system. Finally, section four concludes.

1. COMPETITION EFFECTS OF BANK MERGERS

1.1. Theoretical issues

Following CARLETTI, HARTMANN and SPAGNOLO, the debate on competition effects of bank consolidation can be paraphrased in terms of the conflict between two countervailing hypotheses: the *structure-conduct performance* (SCP) hypothesis and the *efficient-structure* (ES) hypothesis. The former predicts reductions in competition and increases in market power as a consequence of concentration, and, insofar as each firm involved in the merger internalizes the effects of a change in its price on the demand of all other merged firms, consolidation leads to upward pressure on prices³. In contrast, the ES thesis holds that differences in market shares/concentration generate efficiencies of growing firms and therefore consolidation tends to reduce prices⁴.

2 Cfr. GRIMES WARREN and SULLIVAN LAWRENCE, *The Law of Antitrust: an integrated handbook*, West Group, Boston 2000, pg. 512.

3 MASON EDWARD, "Price and production policies of large-scale enterprise", *American Economic Review*, 29: 61-74, 1939; BAIN JOE, "Relation of profit rate to industry concentration", *Quarterly Journal of Economics* 65: 293-324, 1956, cited by CARLETTI ELENA, HARTMANN PHILIP and SPAGNOLO GIANCARLO, *Implications of the bank merger wave for competition and stability*, Bank for International Settlements, Basel 2002, pg. 40.

4 DEMSETZ HAROLD, "Industry structure, market rivalry, and public policy", *Journal of Law and Economics* 16:1-9, 1973; PELTZMAN SAM, "The gains and losses from industrial concentration", *Journal of Law and Economics* 20:229-263, 1977. Both cited by CARLETTI ELENA, HARTMANN PHILIP and SPAGNOLO GIANCARLO, *op. cit.*, pg. 40.

More specifically, the SCP thesis emphasizes that even though potential anticompetitive effects of a merger will vary with the type of merger, what they have in common is a propensity to increase the merging parties' market power and, correlatively, the potential for abuse of that power. From this perspective, the more concentrated an industry, the more likely is oligopolistic behavior by that industry. Additionally, an oligopoly probably reduces the interest of enterprises in research and development initiatives, decreasing the prospect of innovative products or services being discovered or, if they are discovered, being marketed promptly to consumers⁵.

The ES view, on the contrary, suggests that, by creating a larger firm, mergers can generate *economies of scale* (that is, economic gains won when larger output allows a firm to lower its costs per item sold)⁶. Likewise, if two firms merge, they consolidate their research and development, thus eliminating the redundancy in which separate entities would fall. Further, the combined resources of a firm may enable it to undertake more expensive research and development beyond the means of either firm by itself⁷. These efficiencies, in fact, constitute one of the defenses that some juridical systems have acknowledged for mergers whenever they are deemed presumptively anticompetitive because of the high concentration they generate. In the case of the United States, for instance, in *FTC v. University Health Inc.*, 938 F.2d 1206, 1222 (11th Cir. 1991), the court held that a defendant

5 SCHERER FREDERICK and ROSS DAVID. *Industrial market structure and economic performance*, Houghton Mifflin, Boston 1990. Pgs. 189-190. According to SCHERER and ROSS, this reasoning, nonetheless, may not be an accurate clue to any given industry's behavior. For example, a market with only three participants could be competitive if one of the firms were an aggressive competitor. On the other hand, an industry with ten participants may operate with minimal competition because of parallel pricing and marketing practices by the participants.

6 GRIMES WARREN and SULLIVAN LAWRENCE, *op. cit.*, pg. 526. In the real sector, the above-mentioned economies of scale are susceptible to be divided into those that occur at the production level and those that occur at the distribution level. At the production level, economies may occur at the plant level (for example, higher output that allows for more efficient use of machines) or at the multiplant level (for example, increased specialization among plants that reduces the need for costly changeovers of equipment and allows greater worker specialization). At the distribution level, a merger allows a firm to make more efficient use of its sales and advertising resources.

7 *Ibidem*, pg. 527. In the productive sector, mergers that allow firms to integrate vertically can also produce significant efficiencies. A company may, for example, be active only in drilling for oil and supplying it to upstream buyers. But it may be more efficient for the company to integrate and possess its own pipelines, refining facilities, distributors and even retail outlets. This vertical integration would not bring economies of scale but might reduce *transaction costs*, as long as the firm would have a secure outlet for its petroleum production (therefore allowing for better long-term planning and investment). The downstream facilities might receive similar benefits from a secure supply of petroleum. But even two wholly unrelated firms, should they merge, may be able to cut certain administrative costs. For example, the cost of arranging an annual meeting or of accounting and tax preparation services will probably be less than that incurred by two separately operating firms. Further, the formation of a conglomerate enterprise can be seen as a way of pooling the risk of business cycles by operating in diverse lines of business.

“may rebut the government’s prima facie case with evidence showing that the intended merger would create significant efficiencies in the relevant market”⁸.

However, such acknowledgement has not been uniform, particularly prior to the 1992 U.S. mergers guidelines. In *FTC v. Procter & Gamble Co.* 386 U.S. 568 (1967), for example, the U.S. Supreme Court of Justice held that

“possible economies cannot be used as a defense to illegality (...) Congress was aware that some merger which lessen competition may also result in economies, but it struck the balance in favor of protecting competition”.

Similarly, in *United States v. Philadelphia National Bank*, 374 U.S. 321 (1963), the Court argued that *a merger that may substantially lessen competition is not saved because*

“on some ultimate reckoning of social or economic debits and credits, it may be deemed beneficial”⁹.

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- 8 Other examples in which an efficiency defense was entertained but rejected are *FTC v. Staples, Inc.*, 970 F. Supp. 1066, (D.D.C. 1997); *FTC v. Cardinal Health*, 12 F. Supp. 2d 34 (D.D.C. 1998); *FTC v. Alliant Techsystems, Inc.*, 808 F.Supp. 9, 23 (D.D.C. 1992). Welcoming also the possibility to consider the defense in question, Section 4 of the 1992 U.S. Merger Guidelines (as revised in 1997) provides that efficiencies, when reflected in benefits to consumers such as “lower prices, improved quality, enhanced service or new products”, can configure a permission for a merge that would otherwise be forbidden because of concentration considerations.
- 9 GRIMES WARREN and SULLIVAN LAWRENCE, *op. cit.*, pgs. 529-530, 612-616. In words of GRIMES and SULLIVAN, other benefits derived from entrepreneurial consolidation are *capital market mobility, increased buying power, synergies and the avoidance of business failures*. As regards capital market mobility, consolidation through hostile takeovers can be perceived as an outgrowth of the market incentive to place capital in uses with the highest return. Thus, a bidder in a hostile takeover attempt might expect to manage the target company more efficiently, with a net benefit to society from the more productive use of the target firm’s assets. But, independent of hostile takeovers, there is a positive linkage between consolidation and liquidity of investments. An entrepreneur that invests heavily in an enterprise has an interest in being allowed to sell that ownership to recover the value of the investment. If all acquisitions of firms were tightly regulated, the sale of an ongoing business with its valuable good will would become troublesome. On the other hand, this legitimate interest in the free transferability of a firm’s ownership is undermined minimally if regulation prohibits only a limited and previously defined category of mergers. For example, under a policy of prohibiting horizontal mergers that substantially increase market share, an entrepreneur may be prohibited from selling to a major competitor, but will still be free to sell to other potential buyers. Any reduction in the sale value of the enterprise would then presumably reflect only the buyer’s inability to reap an anticompetitive gain associated with a merger that increases market power. The benefit of *increased buying power* alludes to the possibility of merged firms to bargain more effectively for the purchase of inputs; this, in turn, allows them to compete more effectively against other enterprises. In effect, the ability of large buyers to obtain competitive prices even after a merger that would produce a substantial increase in concentration in the relevant market constitutes a defense to consolidations presumed anticompetitive. This is explained not only by the possibility that such buyers have to force market participants to discount prices, but also by their probable capability of entering the upstream industry (or sponsor a new entrant) in order to force down prices. Therefore, if large buyers are able to bring about price

1.2. Empirical evidence on loan rates, quantities lent to small businesses and retail deposit markets

In respect of the United States, HANNAN¹⁰ and Berger and HANNAN¹¹, show that loan market concentration increases small business and consumer lending rates, in line with increased market power of lenders. In the context of the Italian banking sector, Sapienza¹² shows that only the largest mergers increased credit line rates, whereas smaller ones were associated with cheaper credit lines (indicating that efficiency gains could offset market power consequences in those cases).

reductions for all buyers (including small ones), there is no short-term adverse effect on pricing as a result of a concentration-enhancing merger in the supplier side. In *United States v. Baker Hughes*, 908 F.2d 981, 986 (D.C. Cir. 1990), for example, the court declined to enjoin a proposed merger because buyers had leverage to thwart higher prices through a procurement system of multiple and confidential bids, and because entry into the sellers' market was deemed to be relatively easy. In contrast, in *FTC. v. Cardinal Health*, 12 F. Supp. 2d 34 (D.D.C. 1998) and *United States v. United Tote*, 768 F.Supp. 1064 (D.Del. 1991), the *buyer defense* failed on findings that smaller buyers would not necessarily benefit from discounted prices obtained by large buyers. The term *synergies* describes potential financial gains, that is, financial gains that are less certain in their occurrence and reach than others kinds of gains (*efficiencies*). For example, a proposed merger of a cable television company and a regional telephone company might enable the merged entity to better compete in providing a full range of entertainment and information services to customers. Certainly, such benefits may occur, but it does not imply that they do not remain highly uncertain. Finally, the capability of mergers to avoid the failure of the acquired firm is reflected in the *failing industry defense*, which is acknowledged both by regulation and jurisprudence. Such acknowledgement dates back to *International Shoe v. FTC*, 280 U.S. 291, 50 S.Ct. 89, 74 L.Ed. 431 (1930) and is developed, among others, in *Citizen Publishing Co. v. United States*, 394 U.S. 131, 89 S.Ct. 927, 22 L.Ed.2d 148 (1969), where the Court argued that proponents of the defense would have to show that the acquired enterprise would inevitably fall into insolvency, that all alternative ways of saving it were tried or explored and found wanting, and that no alternative buyer whose purchase might pose fewer competitive risks could be found. Section 5 of the 1992 U.S. Merger Guidelines reiterate such defense (including the mentioned limitations established in *Citizen Publishing Co. v. United States*). It must be taken into account that in *United States v. General Dynamics Corp.*, 415 U.S. 486, 503, 94 S.Ct. 1186, 39 L.Ed.2d 530 (1974), the reasoning under which the Court analyzed the corresponding merge was the "probable future ability to compete". The Supreme Court's focus on a firm's future ability to compete can be read, according to GRIMES and SULLIVAN, as a permission of a "financially weak competitor defense". In fact, in *United States v. International Harvester Co.*, 564 F.2d. 769, 773 (7th Cir. 1977), it was concluded that the merging firms' market share did not establish a *prima facie* case because of the acquired firms' "weak financial reserves". However, in *Kaiser Aluminium & Chemical Corp. v. FTC.*, 652 F.2d 1324, 1339 (7th Cir. 1981), the significance of *weak financial condition* was limited, as it was held that it is "one relevant economic factor among many" to be considered in assessing the competitive effects of a merger.

10 HANNAN TIMOTHY, "Bank commercial loan markets and the role of market structure: evidence from surveys of commercial loans", *Journal of Banking and Finance*, 15: 133-49, 1991; HANNAN T.H., "Market share inequality, the number of competitors, and the HHI: an examination of bank pricing", *Review of Industrial Organization*, 12: 23-35, 1997.

11 BERGER ALLEN and HANNAN TIMOTHY, "Using efficiency measures to distinguish among alternative explanations of the structure-performance relationship in banking", *Managerial Finance*, 23(1): 6-31, 1997.

12 SAPIENZA PAOLA, "The effects of bank mergers on loan contracts", *Journal of Finance*, 57(1): 329-67, 2002.

Apart from pricing considerations, bank mergers may induce drastic reductions of credit available to small businesses. This statement is based on the observation that small banks mainly make small loans (since they do not have large enough balance sheets for more sizeable loans often required by larger businesses), and that large banks tend to lend to large businesses (as long as the monitoring costs of many small companies would be sub-optimal for them). Hence, despite the fact that reductions in lending could be the consequence of the elimination of previously inefficient loans (i.e., those funding negative net present value projects), consolidation carries within it the possibility to create inefficient credit supply, hurting particularly the emergence of small startup firms¹³. Nevertheless, STRAHAN and WESTON find that when small U.S. banks merged in the mid-nineties, their post-merger small business lending was actually higher than before. For mergers among larger banks changes were insignificant¹⁴. On the contrary, PEEK and ROSENGREN document for a relatively small cross section in the New England area during 1993-1994 that when a large bank takes over a small one, the small business lending by the target is lower than before (being a small part of this effect offset by new entrants in the local market)¹⁵. For Italy, Sapienza also shows that merged banks are less likely to extend a credit line to a small business than before merging¹⁶.

Another group of authors argues that merged banks reduce small lending, but that this effect is offset by incumbent rival banks expanding their loans or *de novo* entry in the same local market. For example, BERGER, SAUNDERS, SCALISE and UDELL find that U.S. mergers have significantly increased small business loans by competitor banks¹⁷; analogously, Goldberg and White consider the fact that the late eighties and early nineties saw a large number of new bank charters, in parallel with the merger wave, and estimate that *de novo* banks have a notably larger share of small business loans on their balance sheets than comparable incumbents¹⁸.

13 BERGER ALLEN, KASHYAP ANIL and SCALISE JOSEPH, "The transformation of the US banking industry: what a long, strange trip it's been", *Brookings Papers on Economic Activity* 2: 55-201, 1995.

14 STRAHAN P.E. and WESTON J.P., "Small business lending and bank consolidation: is there cause for concern?". *Current Issues in Economics and Finance*, 2(3): 1-6, 1996.

15 PEEK J. and ROSENGREN E.S., *Small business credit availability: how important is size of lender?*, in SAUNDERS A. and WALTER I. (editors), *Universal banking: financial system design reconsidered*, Irwin Publishing, Burr Ridge, IL. 1996.

16 SAPIENZA P., *op. cit.*, 330 and forth on.

17 BERGER ALLEN, SAUNDERS ANTHONY, SCALISE JOSEPH and UDELL GREGORY, "The effects of bank mergers and acquisitions on small business lending", *Journal of Financial Economics*, 50: 187-229, 1998.

18 GOLDBERG L.G. and WHITE L.J., "De novo banks and lending to small businesses: an empirical analysis", *Journal of Banking and Finance*, 22: 851-67, 1998.

BERGER, DEMSETZ and STRAHAN combine these two facts and find that consolidation in local markets positively increases the *likelihood of new entrants in that market* (and that the new players have a larger share of small loans in their portfolio)¹⁹. MOREOVER, BERGER, ROSEN and UDELL show that in markets with a higher share of large banks, small businesses have a higher likelihood of receiving a credit line, and even at lower interest rates, than in markets composed of smaller banks²⁰.

As regards the effects of bank mergers on deposit markets, in the United States it is found a statistically significant negative relation between market concentration and various customer deposit rates (such as those for money market deposit accounts, short-term certificates of deposit or negotiated order withdrawal accounts)²¹. For instance, BERGER and HANNAN estimate that banks in the most concentrated markets pay twenty five (25) to one hundred (100) basis points less on their deposits than banks operating in the least concentrated markets²². For Italy, Japelli finds that there are significant pricing differences between Northern and Southern Italian banks. He further shows that these differences cannot be fully accounted for by variations in risk or the cost structure of banks, and argues that they reflect the higher concentration of banks in Southern Italy. More broadly, for Europe, Corvoisier and Gropp point out that increasing concentration leads to collusion and higher interest margins of banks for loans and demand deposits. This is not the result, however, for savings and time deposits. The reason of this difference is that concentration in the market for demand deposits probably results in less favorable terms for customers, as demand for demand deposits are largely determined by geographical proximity. This denotes that it is relatively costly for firms and households to shop around for such deposits outside their local market. Additionally, the market for loans is a markedly information-intensive product, and insofar as banks familiar with the local economy have a comparative advantage in generating this information, they may use this advantage to extract rents from borrowers

19 BERGER ALLEN, DEMSETZ REBECCA and STRAHAN PHILIP, "The consolidation of the financial services industry: causes, consequences, and implications for the future". *Journal of Banking and Finance*, 23: 135-94, 1999.

20 BERGER ALLEN, ROSEN RICHARD and UDELL GREGORY, "The effect of market size structure on competition: the case of small business lending", *Federal Reserve Bank of Chicago*, working paper, n° 2001-10, Chicago, IL 2001.

21 BERGER ALLEN and HANNAN TIMOTHY, "The price-concentration relationship in banking", *Review of Economics and Statistics*, 71: 291-99, 1989; BERGER ALLEN and HANNAN TIMOTHY, "Deposit interest rates and local market concentration", in WEISS LEONARD (editor), *Concentration and price*, MIT Press, Cambridge, MA, 1989. Pgs. 255-65; CALEM P.S. and CARLINO G.A., "The concentration/conduct relationship in bank deposit markets", *Review of Economics and Statistics*, 73(2): 268-76, 1991; NEUMARK D. and SHARPE S.A., "Market structure and the nature of price rigidity: evidence from the market for consumer deposits". *Quarterly Journal of Economics*, 107: 657-80, 1992.

22 BERGER ALLEN and HANNAN TIMOTHY, "The price-concentration relationship in banking", cit., pgs. 291-299.

Unlike demand deposits, savings and time deposits do not require geographical proximity of the supplier; rather, firms and households will probably be willing to incur the relatively small costs of seeking up higher interest rates outside their local market. For these bank products, therefore, contestability is likely to play a more significant role.

In more precise terms, average contractual rates on customer loans in a banking market with a Herfindahl index²³ of 300 (e.g. the Netherlands or Finland) are estimated to be about 120 basis points higher than in a market with a Herfindahl index of 100 (Portugal, Spain or Belgium). Demand deposits are estimated to be remunerated with an interest rate that is 140 basis points lower in the more highly concentrated market. In contrast, higher concentration in savings and time deposits results in 280 basis points higher remuneration of savings deposits and 100 basis points for time deposits²⁴.

2. STABILITY EFFECTS OF BANK MERGERS

According to CARLETTI and HARTMANN, the banking system is particularly vulnerable to instability due to the following reasoning: on the asset side, banks specialize in assessing the relative viability and profitability of projects put forward by entrepreneurs and, based on their information production on these projects, they grant loans; on the liability side, banks rely to a significant extent on several short-term demandable deposits, which they pool and then invest in long-term loans to production firms. This maturity mismatch between assets and liabilities, together with the strong information content of their assets, makes banks play the additional role of providers of liquidity to depositors, but, in the absence of deposit insurance, it also exposes them to the possibility of runs. Moreover, banking institutions lend and borrow among each other in large amounts to cushion daily liquidity fluctuations. They are also heavily involved in conducting the large value of payments resulting from their own and their customers' activities. For these physical exposures and for information asymmetries about their relative performance, absent safety provisions, there is a risk that the problem of one bank propagates to other banks, creating one form of systemic risk (the risk of interbank contagion). The other form of systemic

23 The Herfindahl-Hirschman index is defined as the sum of the squared market shares of all active banks in a given market.

24 CORVOISIER SANDRINE and GROPP REINT, "Bank concentration and retail interest rates", European Central Bank, working paper n° 72, Frankfurt 2001, pgs. 20-25.

risk is that aggregate shocks to the economy may deteriorate the viability of a significant number of correlated projects at the same time, thereby bringing a larger number of banks simultaneously into illiquidity²⁵.

In this context, it has been held that the erosion of market power is a source of banking instability, insofar as large banks can diversify better their risks, so that banking systems characterized by a few banks will be less fragile than banking systems with many small banks²⁶; likewise, it is argued that a few large banks are easier to monitor than many small banks, so that corporate control will be more effective and the risks of contagion less pronounced in a concentrated banking system²⁷. In a parallel manner, HELLMANN, MURDOCH and STIGLITZ hold that concentrated banking systems enhance profits and therefore lower bank fragility, as long as such high profits provide a buffer against adverse shocks and increase the franchise value of the bank, reducing incentives for bank owners to take excessive risk²⁸. In fact, EDWARDS and MISHKIN argue that the excessive risk-taking observed in the eighties in the United States was banks' response to the erosion of profits due to competition from financial markets, as long as such competition decreased their cost advantages in the acquisition of funds and undermined their position in the loan market²⁹.

In a framework of *relationship banking*, BESANKO and THAKOR also show that increased competition induces banks to choose riskier portfolio strategies. This is because in the course of the relationship with their borrowers, banks acquire private information that generates informational rents. As long as banks appropriate at least part of these rents, they have an incentive to limit their risk exposure so as to enjoy the value of the relationship. However, as soon as the banking industry becomes

25 CARLETTI ELENA and HARTMANN PHILIP, *Competition and stability. What is special about banking?* European Central Bank, working paper n° 146, Frankfurt 2002, pg. 9.

26 PAROUSH J., "The effects of mergers and acquisition activity on the safety and soundness of a banking system", *Review of Industrial Organization*, 10: 53-67, 1995. Drawing on the merger of Manufacturers Hannover Trust Co. and Chemical Bank in the United States, PAROUSH provides an example in which the loan concentration across four sectors (consumer, business, real estate and international loans) of the merged entity is lower than the concentration of loans in each predecessor bank. Hence, asset-side risk concentration is supposed to be diversified through mergers.

27 ALLEN FRANKLIN and GALE DOUGLAS, *Comparing Financial Systems*. MIT Press, Cambridge and London 2000; ALLEN FRANKLIN and GALE DOUGLAS, "Competition and Financial Stability" World Bank Mimeo, Washington D.C. 2003; MARCUS, ALAN, "Deregulation and bank financial policy", *Journal of Banking and Finance*, 8, 557-65, 1984.

28 HELLMAN THOMAS, MURDOCK KEVIN and STIGLITZ JOSEPH, "Liberalization, Moral Hazard in Banking and Prudential Regulation: Are capital Controls enough?", *American Economic Review* 90(1): 147-165, 2000.

29 EDWARDS F. and MISHKIN F., "The decline of traditional banking: implications for financial stability and regulatory policy", *Federal Reserve Bank of New York Economic Policy Review*, 1: 27-45, 1995.

more competitive, *relationship banking* decreases in value and banks take more risk, particularly when deposits are backed by a risk insensitive insurance scheme³⁰.

The empirical work of KEELEY backs up the mentioned theoretical statements by showing for seventy-seven (77) bank holding companies from the United States between 1984 and 1986 that the affection of market power during the eighties led to a higher risk premium that banks had to pay on certificates of deposit and to lower capital-to-asset ratios³¹. From an inverse view, Craig and Santos compare the pre-merger and post-merger risk characteristics of two-hundred-fifty-six (256) acquisitions by bank holding companies from the United States between 1984 and 1993, and find that the sample banks showed increased post-merger profitability and reduced post-merger risk³². In the same way, HOGGARTH, MILNE and WOOD compare the relative performances of the United Kingdom and the German banking systems during 1971 and 1997. It turns out that banking profits in the U.K. were consistently higher than in Germany but also much more variable (similar to asset prices). Higher U.K. profitability is explained by higher non-interest income and lower staff costs, whereas greater German stability is explicated by lower and more stable inflation as well as less competition, particularly from foreign entrants³³. Regarding a wider sample, BECK, DEMIRGÜÇ-KUNT and LEVINE, using data on seventy-nine countries over the period 1980-1997, show that crises are less likely in more concentrated banking systems and in countries with fewer regulatory restrictions on bank competition and activities³⁴.

From another stance, CARLETTI, HARTMANN and SPAGNOLO hold that a cornerstone of a stable banking system is a robust and liquid *interbank money market* (which

30 BESANKO D. and THAKOR A.V., *Relationship banking, deposit insurance and bank portfolio*, in MAYER C. and VIVES X. VIVES (editors), *Capital Markets and Financial Intermediation.*, Cambridge University Press, Cambridge 1993, Pgs. 292-318.

31 KEELEY MICHAEL, "Deposit insurance, risk and market power in banking", *American Economic Review*, 80: 1183-1200, 1990.

32 CRAIG B. and SANTOS J.C., "The risk effects of bank acquisitions". *Federal Reserve Bank of Cleveland Economic Review*, 33: 25-35, 1997.

33 Cfr. HOGGARTH G.A. MILNE G. and WOOD G. "Alternative routes to banking stability: a comparison of UK and German banking systems", *Financial Stability Review*, 5: 55- 68, 1998. However, STAIKOURAS and Wood undertake a similar exercise for Greece and Spain during the nineties, finding that Spanish banks as a whole are both more profitable and more stable than Greek banks, except that the sub-group of Spanish commercial banks is less stable. In turn, the Spanish banking sector is more competitive than the Greek one, which still has a larger public involvement. This comparison is then consistent with the hypothesis of no trade-off between competition and stability. In this respect, see: STAIKOURAS C. and WOOD G., "Competition and banking stability in Greece and Spain", *Journal of International Banking Regulation*, 2(1): 7-24, 2000.

34 Cfr. BECK THORSTEN, DEMIRGÜÇ-KUNT ASLI and LEVINE ROSS. *Bank Concentration and Crisis*. World Bank, working paper 3041, Washington D.C. 2003. Pgs. 2-5, 22-23.

is particularly important since it links large banks to each other, hence a problem in this market produces widespread consequences). In this sense, a merger creates an internal money market, saving interbank borrowing costs for the merged institutions; as a consequence of such an internal money market, the consolidated entities also enjoy lower liquidity risk and expect lower liquidity needs than competitor banks. Therefore, regarding individual bank liquidity risk, the effect of consolidation goes in the same direction as the one derived by the risk diversification posture³⁵.

From a reverse causation standpoint, BESTON, HUNTER and WALL argue on the basis of pre-merger earning volatility that the motivation for mergers in the first half of the eighties must have been risk reduction through diversification³⁶. For cross-border mergers, AMIHUD, on the contrary, shows that international consolidation between 1985 and 1998 had no systematic effects on acquiring bank's total stock price risk, which is susceptible to be explained by the fact that diversification benefits can be offset by particular monitoring problems associated with foreign operations³⁷.

BOYD and GRAHAM, by their side, document that on average large banks in the United States failed more often than small banks during the seventies and the first half of the eighties but not during the late eighties and early nineties. They justify SUCH phenomenon on the fact that better diversification of larger banks does not reduce failure risk systematically, potentially as a consequence of an implicit financial safety net or tacit *too-big-to-fail* protection³⁸. Akin to this conclusion, CAMINAL and MATUTES show that a monopoly bank may face higher risk of failure than a competitive bank because such a monopoly bank uses more monitoring and less credit rationing to deal with the borrower's moral hazard problem. This induces monopoly banks to grant larger loans than competitive banks, and, since loans are subject to multiplicative uncertainty, a higher probability of failure materializes. As a

35 Cfr. CARLETTI ELENA, HARTMANN PHILIP and SPAGNOLO GIANCARLO. Op. Cit., pg. 45.

36 BESTON G.J., HUNTER W.C. and WALL L.D. "Motivations for bank mergers and acquisitions: enhancing the deposit insurance put option versus earnings diversification", *Journal of Money, Credit, and Banking*, 27(3): 777-88, 1995.

37 AMIHUD YAKOV, DE LONG GAILE and SAUNDERS ANTHONY, "The effects of cross-border bank mergers on bank risk and value", *Journal of International Money and Finance*, 21: 857-877, 2002.

38 BOYD J. and GRAHAM S., "Investigating the banking consolidation trend". Federal Reserve Bank of Minneapolis Quarterly Review, Spring, 1-15, 1991. DE NICOLO reasserts that failure probabilities increase with size not only for U.S. banks but also for European and Japanese banks, and, as additional explanation to the ones put forward above, he finds that state ownership has a positive impact on failure risk of banks. See: DE NICOLO G., "Size, charter value and risk in banking: an international perspective", *International Finance Discussion Paper*, n° 689, Board of Governors of the Federal Reserve System, 2000.

consequence, the relationship between market power and failure probability must be deemed ambiguous³⁹.

From an alternative viewpoint, CORDELLA and YEYATI hold that with fixed-rate deposit insurance, enhanced competition increases deposit rates and risk through lower product differentiation and lower margins. In contrast, when deposit insurance premiums are risk-adjusted, deposit rates and asset risk are lower. Thus, when risk-based deposit insurance premiums can be implemented, banks can credibly commit to reduce asset risk, therefore lowering the cost of funds and improving their overall performance despite competition on deposits⁴⁰. Another alternative regulatory instrument to control banks' risk taking in competitive markets is proposed by PEROTTI and SUÁREZ. According to them, whenever a bank fails, the regulator must decide whether to close the failing institution or to merge it with another bank, either an incumbent (merger policy) or a new entrant (entry policy). The two policies imply a trade-off between stability and competition. By reducing competition, a merger involves monopoly inefficiency but also prudent bank behavior (since such policy induces banking institutions to remain solvent in order to have the capability to acquire other entities in the future); in contrast, entry implies more efficiency but riskier bank behavior. The optimal policy instrument is then a combination of active rescues followed by entry. This creates *ex ante* incentives for banks to remain solvent to acquire failing institutions while at the same time limiting the *ex post* market power that surviving banks get through the rescue. Thus, the use of active merger policy and temporary entry restrictions can endorse stability⁴¹.

In line with diversification, DEMSETZ and STRAHAN argue that larger banks have lower stock return volatility if their portfolios are held constant, but when loan portfolios are allowed to vary, risk is no longer reduced. More exactly, the DEMSETZ and STRAHAN's analysis draws upon two portfolio principles: (i) diversification reduces risk and (ii) the potential for diversification increases with the size of a portfolio. If a large bank holding company is just a scaled-up version of a small bank holding

39 CAMINAL RAMÓN, and MATUTES CARMEN, "Market power and banking failures", *International Journal of Industrial Organization*, 20 (9): 1341.1361, 2002.

40 CORDELLA T. and YEYATI E.L. YEYATI. "Financial opening, deposit insurance and risk in a model of banking competition". *European Economic Review*, 46(3): 471-485, 2002. MATUTES and VIVES share the position in accordance with which when deposit insurance premiums are risk adjusted, deposit rates and bank asset risk are lower than in an economy without deposit insurance. In addition, they hold that competition leads to excessive deposit rates and, as a result, both deposit regulation (deposit limits or rate ceilings) and investment restrictions are needed to remove the perverse effect of competition. On this point, see: MATUTES CARMEN and VIVES XAVIER, "Imperfect competition, risk taking and regulation in banking", *European Economic Review*, 44(1): 1-34, 2000.

41 PEROTTI E. and SUÁREZ J., *Last bank standing: what do I gain if you fail?* Center for Economic Policy Research, discussion paper 2933, London 2001.

company, then it is possible to expect that large companies exhibit lower risk because of the benefits of diversification. Both small and large bank holding companies engage in loan origination and loan funding, with large companies generally having access to a broader deposit base and a wider variety of borrowers. This diversification potential works to reduce the risk of large bank holding companies. If, however, there are significant differences in the *nature* of the assets, liabilities and off-balance-sheet positions of large and small banking institutions, then large entities might not exhibit lower risk than small companies.

Using data from 1987 to 1993, Chart 1 illustrates the empirical relationships between size and each of the two components of equity risk (systematic and firm-specific risk)⁴². Once asset size exceeds \$5 billion, it can be observed a positive relationship between asset size and systematic risk. Firm-specific risk is highest for the smallest size group but otherwise bears little relationship to size. The mix between systematic and firm-specific risk at large bank holding companies (those with assets of more than \$25 billion) is notably different from the mix at small companies (those with assets of less than \$5 billion). In particular, firm-specific risk makes a bigger contribution to total equity risk at small companies than at large ones (that contribution falls from 73% to 53% as asset size increases). By combining the two components of risk, Chart 2 shows how total equity risk varies with holding company size (whereby little discernible relationship can be found).

The patterns illustrated in these charts provide empirical support for the idea that size enhances diversification, since firm-specific risk makes a smaller contribution to total equity risk at large bank holding companies. However, size also appears to lead to an increased engagement in certain risky activities: systematic risk (unaffected by diversification) increases by 70% from companies with \$5 billion to \$10 billion in assets to those with more than \$25 billion. As it is pointed below, portfolio disparities

42 Equity risk is divided by the authors into two components: the first component, *systematic risk*, measures equity return variability related to underlying economic conditions affecting the banking industry as a whole. The remaining variability in stock returns, *firm-specific risk*, measures equity return variability unique to each company. Because the narrowly diversified banking company is subject to shocks stemming from industrial, regional or other types of asset or liability concentrations, it is likely to display a large amount of firm-specific risk (risk that a better diversified company is much more likely to avoid). Using this reasoning, if large bank holding companies are simply scaled-up, better diversified versions of small bank holding companies, then the greater a company's size, the lower its *firm-specific risk*. Since diversification reduces only firm specific risk, however, it should not be observed any relationship between size and systematic risk. The end result would be an inverse relationship between size and total equity risk. In contrast, if large bank holding companies are not simply scaled-up versions of small companies, these relationships not necessarily hold. For instance, if large companies pursue riskier activities, it may be observed a positive relationship between size and either of the two components of equity risk, even if large bank holding companies are more diversified. The relationship between size and total equity risk would then be ambiguous.

of small and large bank holding companies can also affect how firm-specific risk varies with size, covering up the negative relationship that could be expected to be seen if large bank holding companies were simply scaled-up, better diversified versions of small companies. Throughout most of the period examined, large companies were more likely to be involved in the relatively safe activities of home mortgage and consumer lending (table 1). Of particular interest are differences in lending behavior, capital ratios, and geographical diversification. For example, the typical large company⁴³. was far more likely to diversify geographically by operating commercial banking subsidiaries in more than one census region or by accepting foreign deposits. At the same time, the large bank holding company also engaged in more commercial and industrial lending and less consumer lending, and operated with a smaller capital ratio⁴⁴. Finally, large bank holding companies were more likely to hold assets in their trading accounts, were more likely to participate in derivatives markets and generated a larger percentage of income from non-interest revenues⁴⁵. As a consequence, large bank holding companies are better diversified than small ones, but are no less risky. Thus, the portfolios of the large companies, characterized by greater leverage and riskier activities, offset the diversification advantage of size⁴⁶.

43 Typical large company characteristics are defined as the median characteristics for the sample of companies with more than \$25 billion in assets. Typical small company characteristics are defined as the median characteristics for the sample of companies with less than \$5 billion in assets.

44 Higher leverage, that is, a smaller capital-to-assets ratio, increases equity risk because changes in asset values at highly leveraged firms have a larger impact on equity value.

45 DEMSETZ and STRAHAN calculate that changing from the capital-to-assets ratio of the small bank holding company to that of the large company leads to a 12% increase in systematic risk and a 20% increase in firm-specific risk. Changing from the ratio of commercial and industrial loans to assets of the small bank holding company to that of the typical large company leads to a 13% increase in systematic risk and a 12% increase in firm-specific risk. Some of the other portfolio characteristics described in Table 1 tend to *reduce* the risks of large bank holding companies. For instance, changing from the geographical diversification of commercial bank subsidiaries at the typical small bank holding company to that at the typical large company is associated with a 21% decrease in systematic risk and a 26% decrease in firm-specific risk.

46 DEMSETZ REBECCA and STRAHAN PHILIP, "Historical patterns and recent changes in the relationship between bank holding company size and risk", *Federal Reserve Bank of New York Economic Policy Review*, July, 13-26, 1995. A further question that arises in this context is *why have bank holding companies chosen to counterbalance their diversification advantage by pursuing certain risk-enhancing activities and operating with less capital?* According to DEMSETZ and STRAHAN, first, risk-enhancing activities (such as commercial and industrial lending and participation in derivatives markets) are normally also profit-enhancing for bank holding companies of all sizes. Thus, large companies may be capable of pursuing these activities more intensively because they possess the diversification advantage of size. Also due to their diversification advantage they may choose to operate with lower capital ratios. Second, economies of scale may make it cost-effective for large bank holding companies to specialize in riskier activities. For instance, derivatives dealers must invest in costly resources and such investments are worthwhile only for large-scale operations. A final factor that may explain differences in risk taking by large and small bank holding companies is the moral hazard problem associated with implicit

TABLE 1. Portfolio differences between large and small bank holding companies for 1987 in the United States

Portfolio attribute	Typical small bank holding company (percent)	Typical bank holding company (percent)
Commercial and industrial loan/assets	18.74	23.70
Real estate loan/assets	20.57	16.09
Consumer loan/assets	12.98	10.32
Loan concentration index	29.36	28.89
Trading assets/assets	0.05	2.53
Deposits/assets	78.18	64.28
Non interest deposits/assets	24.67	24.76
Foreign deposits/assets	0.04	21.21
Equity capital/assets	6.43	5.15
Interest rate swaps/assets	0.00	19.20
Foreign exchange futures/assets	0.00	28.72
Non interest income/net interest income	54.17	86.24
Multiple census indicator ⁴⁷	0	1
Source: DEMSETZ and STRAHAN, 1995		

In words of CARLETTI, HARTMANN and SPAGNOLO, on the basis of the literature available it is not possible to ascertain a clear-cut relation between the effects of consolidation and banking risk, as long as there is evidence not only to demonstrate that a more consolidated banking sector would be more stable (in particular if concentration brings about diversification gains which are not offset by the adoption of new risks), but also to demonstrate the opposite (particularly if consolidation worsens the moral hazard of an *implicit financial safety net* or a *too-big-to fail*

financial safety nets or the *too-big-to-fail* policy. HUGHES, LANG and MESTER share this reasoning when they affirm that increased risk-taking by growing banks may be a reflection of the efficient exploitation of scale economies. If size increases go hand in hand with better risk diversification, then the implied lower average and marginal costs of risk management will naturally lead them to take on more risk. In this respect, see: HUGHES J.P., LANG W.S., MESTER L.J. and MOON C. "Efficient banking under interstate branching", *Journal of Money, Credit, and Banking*, 28: 1045-1071, 1996.

47 This variable equals 1 for holding companies with commercial bank subsidiaries operation in more than one census region and zero otherwise.

doctrine, complicates monitoring in agency problems and is related to organizational diseconomies)⁴⁸.

3. ADMINISTRATIVE CONSEQUENCES OF THE STABILITY AND COMPETITION CONCERNS RELATED TO CONCENTRATION WITHIN THE FINANCIAL SECTOR⁴⁹

The pointed works are illustrative in respect of the differing roles attributed to antitrust and supervisory authorities across countries⁵⁰; this, in turn, demonstrates that to give preponderance to either antitrust or supervisory authorities cannot determine *per se* the performance of the financial sector. Examples of this point are offered by the administrative structures in charge of bank merger reviews in G-7 countries⁵¹. Nevertheless, before describing such institutional structures, it is necessary to point out that in the European Union (EU) countries a two-layer regime is in place for the competition review of concentrations, insofar as all mergers with a “community dimension” are examined by the Merger Task Force of the European Commission (in the DG Competition), whereas transactions without “community dimension” are left to the competent national authorities alone. The dividing line between cases that are relevant for the EU as a whole and cases that are only of national relevance is drawn on the basis of the size and geographical dispersion of turnovers⁵². Therefore, the arrangements described below for the four G-7 countries

48 Cfr. CARLETTI ELENA, HARTMANN PHILIP and SPAGNOLO GIANCARLO, *op. cit.*, pg. 44.

49 This section draws upon: CARLETTI ELENA and HARTMANN PHILIP, *Competition and stability. What is special about banking?*, *cit.*, pgs. 11-19.

50 In words of CARLETTI and HARTMANN, three reasons account for the involvement of bank supervisors in merger processes. First, since a banking business requires a special license from supervisors, granted upon the fulfillment of certain special requirements (such as minimum capital ratios), and since a merger can create a new company, it seems logical that banking supervisors have to check that the corporate requirements according to banking regulation would be fulfilled after the merger. Second, it is common practice in many countries that failures of large banks are dealt through restructuring programs, often involving the acquisition of the weak bank by the bank that performs relatively well, be it to avoid the systemic repercussions of a full-scale bankruptcy or to avoid the costs of it to the deposit insurance fund. Since banking supervisors tend to have most part of the information related to each institution, they are supposed to play a central co-coordinating or even leading role in such restructuring programs. Finally, it is probable that the hypothesis according to which too competitive banking sectors are prone to instability conducts some countries to counterbalance the competition-oriented antitrust review with a stability-oriented supervisory review of bank mergers. See: CARLETTI ELENA and HARTMANN PHILIP, *op. cit.*, pgs. 11-12.

51 The comparison is taken from: CARLETTI ELENA and HARTMANN PHILIP, *op. cit.*, pgs. 11-18.

52 European Council, Council Regulation 4064/89/EEC of 21 December 1989 on the control of concentration between undertakings, corrected and amended in 1990 and 1997, 1989. According to Article 1 of the EC Merger Regulation (as reformed in 1997), in the case of banking, income figures are used as a measure of turnovers. ‘Community dimension’ is reached when (a) the aggregate worldwide income of the merging banks is more than 5,000 million euro and (b) the aggregate community-wide income of each of the merging banks is more than 250 million euro.

belonging to the EU (France, Germany, Italy and United Kingdom) are only effective for bank mergers that do not reach the “community dimension”.

France exempts bank merger reviews (below the ‘community dimension’) from the general competition law and formal reviews by competition authorities. The main responsibility is rather with the *Comité des établissements de crédit et des entreprises d’investissement*, which is the one committee (out of a set of committees and commissions in charge of prudential supervision in the financial sector formally headed by the Governor of the *Banque de France*) that deals with bank licensing. The criteria applied by this Committee are determined in the banking law, in which supervisory and other public policy concerns prevail over competition considerations. For example, the examinations consider particularly whether the new institution would act in a way compatible with the smooth functioning of the banking system and with a sufficient security for customers.

In *Italy* the general competition law applies to merger reviews in the banking sector, but the responsibility for the reviews lies in the *Banca d’Italia*, which is also the prudential supervisor of this country. The supervision authority conducts the merger review both from the antitrust and from the supervisory perspective (though in different sub-units). The Antitrust Authority is only required to give a prior non-binding opinion on all cases.

The *United States* grants authority to approve or prevent bank mergers to the relevant supervisory authorities (Federal Reserve Board, Office of the Comptroller of the Currency, Federal Deposit Insurance Corporation and Office of Thrift Supervision). However, the Antitrust Division of the Department of Justice independently reviews the mergers as well and reports its analysis to the supervisor(s) in charge. Even if the merger has been approved by the supervisors, the Antitrust Division can within one month appeal to the judiciary when its analysis contrasts with the decision of the competent supervisor(s). In addition, the United States banking law requires the supervisory agencies to take competition effects into account and not to allow anticompetitive mergers, unless

‘the uncompetitive effects are clearly outweighed in the public interest by the probable effect of the transaction in meeting the convenience and needs of the community to be served’ (availability of banking services).

The *Canadian* banking law assigns the ultimate authority to block or approve a merger of financial institutions to the Minister of Finance. The minister takes this decision assessing the public interest upon receipt of two reports: one from the Competition Bureau, focusing on the competitive effects of the transaction, and one from the Office of the Superintendent of Financial Institutions, focusing on

supervisory concerns. This implies that even if the Competition Bureau considers that a merger transaction should be modified or challenged before the Competition Tribunal, such tribunal can not make an order to this effect if the Minister of Finance has issued a document to the Bureau of Competition stating that the transaction is “...in the best interest of the financial system in Canada”.

Japan subjects bank mergers to the same competition law as for other industries, so bank mergers must be approved by the Japan Fair Trade Commission, which is the sole authority applying the Antimonopoly Act. The fragility of financial institutions (such as debt overhang or even a high probability of bankruptcy) have practically no consequences under the competition law, which focuses entirely on preventing anti-competitive effects on the different banking markets. However, in contrast to other industries, banks envisaging a merger have also to file an application for approval by the Financial Services Agency. This supervisory review is undertaken under the Banking Act, considering the availability of funds in a region, an adequate conduct of business (including the appropriateness of shareholders and managers) and the avoidance of disrupting the market (particularly regarding competition among financial institutions). Formally the merging parties must fulfill the requirements by both.

In *Germany* merger reviews are guided by special rules for banks within the competition law and by some paragraphs in the banking law. In applying the competition rules the Federal Cartel Office can let a merger be accepted without explicit approval of the Federal Supervisory Office. However, if it wants to block one, it has to request the opinion of the supervisor, which, though, is formally non-binding. The Supervisory Office examines the cases from the perspective of banking law and can block a merger if the new shareholders are not regarded appropriate or the management not qualified. In practice, if the Cartel Office and the Supervisory Office come to different conclusions from their respective perspectives and cannot resolve such differences, the Economics (competition) and Finance (supervision) Ministers must find a solution.

In the *United Kingdom* bank merger reviews are conducted under similar rules and procedures as for other industries. Cases raising significant competition concerns are subject to a report by the Office of Fair Trading to the Secretary of State for Trade and Industry, who can refer them to the Competition Commission for a formal investigation. However, even if the Competition Commission finds that the merger is ‘*against the public interest*’, the Secretary of State has *de facto* the power to overturn this view and permit an anti-competitive merger. The Financial Services Authority and the Bank of England, considering prudential and general stability concerns, are consulted during this process.

Bank mergers in the *European Union* that reach the ‘*community dimension*’ are examined, as said before, by the Merger Task Force of the European Commission, applying the *Council Regulation on the Control of Concentrations between Undertakings* (the EC Merger Regulation). This regulation, which applies to all sectors, empowers the Commission to investigate the companies involved and forbid a merger on the basis of competition considerations “*incompatible with the common market*”. The EC Merger Regulation also states that

“Member States may take appropriate measures to protect legitimate interests other than those taken into consideration by the Regulation and compatible with the general principles and other provisions of Community law”.

This introduces a possibility for the member States to interfere in the decisions of the Commission and pursue objectives other than those linked to competition policy. Another route through which EU members can resist to the Commission’s review policy is the so-called Second Banking Directive (Article 5), which stipulates that national supervisory authorities have to be informed about “qualifying” changes in equity holders and

“shall refuse authorization if, taking into account the need to ensure the sound and prudent management of a credit institution, they are not satisfied as to the suitability of the (...) shareholders”⁵³.

As a consequence, although the EU regime of bank merger review (for cases with “*community Dimension*”) is strongly competition-oriented and although absent an EU-wide supervisory authority the Commission’s institutional competence for large bank merger reviews may appear unshared, in practice the EU countries have reserved a relatively large degree of discretion to consider consolidations from a prudential perspective through the involvement of their national supervisors.

4. CONCLUSION

Internalization effect (increase in market power) and the potential efficiency gains of such merger; this implies that the materialization of the SCP or the ES hypothesis in a given consolidation is positively case-dependant and in no sense homogeneous.

53 European Council, Second Council Directive 89/646/EEC of 15 December 1989 on the coordination of laws, regulations and administrative provisions relating to the taking up and pursuit of the business of credit institutions and amending Directive 77/780/EEC, 1989.

Second, whereas several studies find a trade-off between bank competition and stability in the financial sector, it is not possible to affirm that there is a single ever-valid relationship between such variables. First of all, there are scenarios in which increased loan competition reduces asset risk-taking. Second, theory suggests that there are policy options that could ensure competitive and stable banking systems (for example, risk-based deposit insurance or mixed approaches to failure resolution through mergers). Third, the moral hazard of implicit financial safety nets or *too-big-to-fail* policies worsens and monitoring complicates with larger banking institutions. Therefore, as suggested by the Ferguson Report on Consolidation in the Financial Sector,

“the potential effects of financial consolidation on the risk of individual institutions are mixed, the net result is impossible to generalize and thus a case by case assessment is required (...) In part because the net impact of consolidation on individual firms risk is unclear, the net impact of consolidation on systemic risk is also uncertain”⁵⁴.

In this sense, in terms of CARLETTI and HARTMANN, it depends upon the specific case and circumstances whether a change in competition (e.g. a merger) is associated with an increase or decrease of risk in the banking system (...) This, in turn, can be regarded as the central reason behind the diversity of administrative structures or institutional approaches followed in different countries⁵⁵.

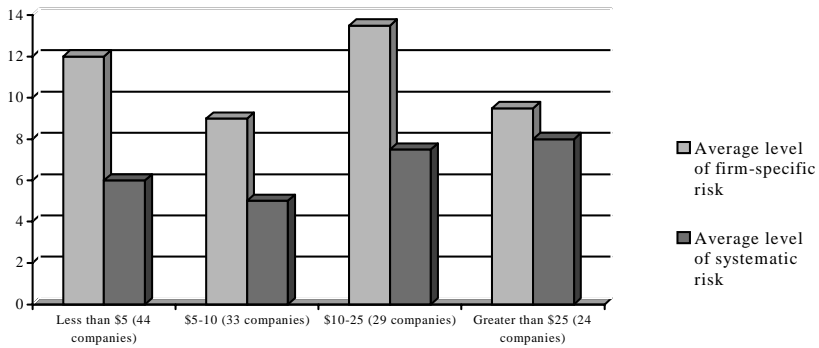
54 Group of Ten, *Report on Consolidation in the Financial Sector*, BIS, IMF and OECD, Washington D.C. 2001, Pg. 3.

55 Cfr. CARLETTI ELENA and HARTMANN PHILIP, *op. cit.*, pg. 29-32.

ATTACHMENT

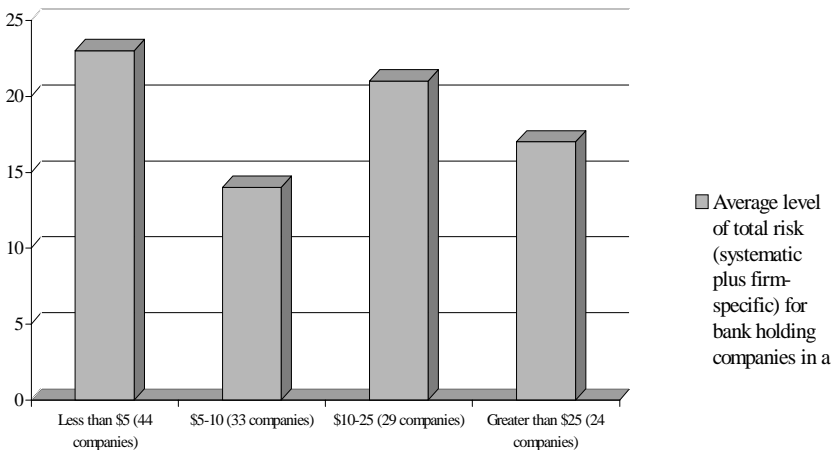
The charts show respectively the relationship between bank holding company size and risk components, and the average level of total risk (systematic risk plus firm-specific risk) for bank holding companies during the period 1987-1993⁵⁶.

CHART 1. Relationship between bank holding company size and risk components for the period 1987-1993.



Source: DEMSETZ and STRAHAN, 1995.

CHART 2. Relationship between bank holding company size and total risk for the period 1987-1993



Source: DEMSETZ and STRAHAN, 1995.

56 DEMSETZ REBECCA and STRAHAN PHILIP, *op. cit.*, pg. 15.

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