

**A New Monopoly-Creating Phase of Bank Consolidation?
The Effect of the Merger of Fleet and BankBoston
on Middle Market Borrowers in New England**

Charles W. Calomiris and Thanavut Pornrojngkool*

March 1, 2004

DRAFT: DO NOT QUOTE WITHOUT PERMISSION

* Calomiris is the Henry Kaufman Professor of Financial Institutions at Columbia Business School, Professor of International and Public Affairs at Columbia's SIPA, the Arthur Burns Fellow in International Economics at the American Enterprise Institute, and a Research Associate at the National Bureau of Economic Research. Pornrojngkool is a Ph.D. candidate at Columbia Business School and an economist at the World Bank. We thank seminar participants at Columbia Business School for helpful comments. Please address comments to: Charles W. Calomiris, email: cc374@columbia.edu

ABSTRACT

This study points out the weakness of the current criteria regulators use to evaluate bank mergers. Under the current framework, the Federal Reserve Board applies the Department of Justice Merger Guidelines to measure how such a merger will affect the degree of competition in the relevant local deposit market but not in the lending market. We evaluate this approach based on a detailed analysis of the loan market effects of the merger of Fleet and BankBoston in September 1999. Our findings support the argument that the unique advantages of scale and scope economies enjoyed by Fleet and BankBoston in pursuing middle market lending before the merger were passed on to borrowers as a result of competition between the two banks. We estimate that, for some middle market borrowers, those benefits translated into as much as a one percentage point savings on interest cost relative to alternative sources of credit. The newly created market power in the combined entity after the merger erased that discount for some classes of middle market borrowers. We suggest that regulators should consider the consequences of concentration in lending markets in addition to deposit markets when evaluating mergers. In addition, our findings have implications for the proper structuring of asset divestiture policy. In some circumstances, it would be appropriate for regulators to require the divestiture of a viable middle-market lending franchise to preserve competition in the market. Regulators should ensure that the pool of assets divested are sufficient to attract desirable bidders (banks of sufficient scale) to the bidding process.

KEYWORDS: bank merger, middle market lending, monopoly power, economy of scale, economy of scope, asset divestiture.

1. Introduction

Historically, the structure of the U.S. banking industry was highly fragmented. Initially, Supreme Court rulings, restrictions on national banks imposed by the Office of the Comptroller of the Currency, and state laws and regulations governing state chartered banks limited branching. The Bank Holding Company Act of 1956 and its amendments effectively prohibited interstate banking. During the 1980s, most states entered into selective interstate banking agreements that gradually allowed interstate banking on a limited basis. In 1994, legislation effectively eliminated interstate banking restrictions. As a result of these changes, the U.S. banking system has witnessed an accelerated pace of consolidation within and across state borders over the past quarter century.

Proponents of branching and consolidation argued that the removal of such restrictions would promote competition and reduce market power stemming from barriers to entry (e.g. Flannery 1984, Evanoff and Fortier 1988). Consolidated banks also can operate more efficiently through their ability to achieve scale economies associated with better portfolio diversification, scale related economies of scope in product delivery, and lower costs (e.g. Calomiris 2000, Calomiris and Karceski 2000). For the banking system as a whole, an increase in interstate mergers and acquisitions improves average bank performance through better “bank manager discipline” and “survival of the fitness” effects (Jayaratne and Strahan 1996, Hubbard and Palia 1995).

On the other hand, opponents of consolidation have been concerned about an increase in market concentration in some banking markets as a result of mergers. On the deposit side, the potential problem of market power seems to be of little concern, since regulators act to ensure continuing post-market competition in the deposit market, and

because all banks (large and small) can effectively compete for customer deposits. The Bank Holding Company Act requires that the Federal Reserve Board consider the competitive effects of any merger proposal before granting merger and acquisition approval. As an operational procedure, the Fed applies the Department of Justice Merger Guidelines to measure how such a merger will affect the degree of competition in deposit markets. In particular, the Fed considers the change and the level of the Herfindahl-Hirschman Index calculated from deposit shares of all banks in a particular local banking market as a determinant of level of competition in banking markets.

Cetorelli 2002 studies some deposit markets that are highly concentrated and finds evidence that as few as two or three banks competing in the same market are sufficient to create “tough” price competition that would remove monopoly profit. This finding is not surprising given that all banks in the market can compete for customer deposits, and the ability of consumers to access alternative suppliers by car, bus, subway, or the internet.

The concentration of lenders resulting from bank mergers, however, is not emphasized by regulators. The Federal Reserve Board does not extend its anticompetitive analysis of a proposed merger to the lending market. Ensuring that there is no excessive concentration in deposit markets does not preclude market power in at least some segments of the lending market. Theoretical analysis and empirical evidence suggests that lending market concentration may be a bigger area of potential concern than deposit market concentration.¹ In particular, unlike the deposit market, small banks are unable to compete for large loans (because of diversification concerns and loan to one borrower

¹ Cetorelli 2001 provides a review of several theoretical and empirical studies for the positive and negative effects of competition and concentration in banking markets.

regulatory limits). Thus a highly fragmented deposit market may coincide with a market where very few banks are able to provide large loans.

The effects of loan market concentration (defined here as the absence of a sufficient number of local competitors in bank lending) should be heterogeneous across different segments of the loan market. Small borrowers can borrow from all banks, including local community banks.²

Very large borrowers typically operate in many different regions of the country, have established track records of creditworthiness with many national or international banks, and often have access to capital markets. Money center banks compete for their business in a borderless environment. Local loan market concentration should have little or no effect on the largest firms' access to credit.

Of greatest concern, then, is the effect of loan market concentration on *medium-sized* borrowers. We hypothesize that adverse-selection costs can constrain medium-sized borrowers to a geographic area with a limited number of potential suppliers (that is, banks large enough to meet their needs).³ Thus, medium-sized borrowers are most likely to suffer from allowing monopoly power to be created in their local lending market.

This study measures the effects of loan market concentration on middle market borrowers in the clearest case of a merger that reduced competition among large banks within a region – the merger of Fleet and Bank Boston in 1999. We take advantage of the unique circumstances associated with this merger. Notwithstanding the branch

² Petersen and Rajan 1994, 1995 find evidence that small firms may even benefit from market concentration. Their stylized model demonstrates that monopoly bank can solve adverse selection problem suffered by lenders in a competitive lending market when they are faced with a pool of risky but unknown borrowers. It may be easier in a highly concentrated lending market for lenders to establish lending relationships with relatively less known firms.

³ Degryse and Ongena 2002 provide a review of theoretical papers that show the importance of distance in loan pricing and availability. They also provide empirical evidence in support of that model, using data from Belgium banks.

divestitures required by regulators to maintain competition in the deposit market, middle-market lending activities in the New England became highly concentrated in the hands of the combined Fleet-BankBoston entity after the merger. Virtually no other bank with the ability to supply loans of significant size was operating in New England alongside Fleet-BankBoston. Figure I shows the commercial and industrial middle-market lending market shares of the twelve largest Bank Holding Companies located in New England immediately before the merger. Fleet and Bank Boston controlled more than 50% of the pre-merger market share.

To measure the effects of the merger on loan pricing for middle-market borrowers, we perform regression analysis comparing all-in-spreads of loans made by Fleet and BankBoston to those of loans made by other lenders to middle-market borrowers located inside and outside of New England for the period before and after the merger. We organize the paper as follows. The next section describes data sources and outlines the research methods used in the paper. Section 3 presents our empirical findings. Conclusions and policy implications are discussed in Section 4.

2. Data Sources and Research Methods

The loan pricing data are constructed from the DealScan database for U.S. borrowers from two periods. The pre-merger period is from 01/01/1997 to 06/30/1999 and the post-merger period is from 01/01/2000 to 06/30/2002. The six month window of three months before and after the merger (September 1999), is excluded from the sample to allow sufficient time for merger integration to take place. We focus on middle market borrowers, defined as borrowers with annual sales between \$10 million and \$500 million.

Loan observations, including all-in-spread data, are then matched with Compustat or SEC filings for financial statement information.

The final pre-merger sample consists of 235 and 1,826 loan facilities to firms headquartered inside and outside of the New England states, respectively.⁴ The final post-merger sample consists of 177 New England borrowers' loan facilities and 1,650 non-New England borrowers' loan facilities. All loans are assigned to a bank. For syndicated loans, the lead lender is identified using the method defined by DealScan, i.e., the top-left name in the loan documentation.

Table I provides descriptive statistics for loans in our sample, both inside and outside of New England, before and after the merger. Table II breaks down the market share of middle-market lending into three sub-categories according to borrower sales size: the small-sized segment of the middle market (\$10-\$100 million), the medium-sized segment of the middle market (\$100-\$250 million), and the large-sized segment of the middle market (\$250-\$500 million).

For the medium- and large-sized segments of New England middle-market borrowers, the combined market share of Fleet and BankBoston increased significantly from around 40% before the merger to 52% and 66% after the merger respectively, although the amount of their lending to the medium-sized category actually fell substantially. Their market share for the small-sized segment of New England middle-market borrowers decreased from 22% to 10% after the merger. The significant amount of branch divestitures required by regulators may have had a negative impact on the market share of Fleet-BankBoston in the small-sized segment of the market.

⁴ CT, MA, ME, NH, RI, and VT.

It is interesting to note the growth in the middle-market lending market share of Fleet-BankBoston outside of New England after the merger. Their overall market share roughly doubled from 8% to 15% after the merger. Thus, the merger seems to have encouraged them to expand outside of New England. Interestingly, that expansion largely reflects growth in lending to the largest middle-market borrowers. Perhaps the expanded size of the combined Fleet-BankBoston entity allowed it to lower its cost of supplying larger loans (a large loan from the combined entity, after the merger, posed less of a problem for bank diversification than a comparable loan from either bank before the merger).

Table III provides summary statistics for the all-in-spread on loans broken down by size categories, inside and outside of New England, before and after the merger. In New England, Fleet and BankBoston charged roughly 40 basis points less than their competitors, both before and after the merger. Of course, simply looking at the average of all-in-spreads without controlling for the risk characteristics of borrowers, and without distinguishing among borrowers of different size, may provide a misleading picture of changes in loan pricing as a result of the merger. Indeed, we will show below that one can detect important changes in pricing policies for some classes of borrowers, once one takes account of changing characteristics in the pool of borrowers. Lower than average loan spreads on Fleet-BankBoston loans were not found outside of New England, with the exception of the small-sized segment of the middle market after the merger.

Simple regressions

We estimate OLS regression equations predicting the all-in-spreads for loans as a function of loan and borrower risk characteristics. Specifically, we consider the following

regression, run separately for loans made to borrowers inside and outside of New England.

$$SPREAD_i = a + \{BBF_i | SMALL_i | MEDIUM_i | POST_i\}b^{diff} + X_i^{con} b^{con} + u_i \quad (1)$$

where,

- $\{.. | .. | ..\}$ - creates a vector of proper interaction terms of its elements⁵,
 - BBF - is one if BankBoston or Fleet is the lead lender,
 - $POST$ - is one if the observation is from post-merger period,
 - $SMALL$ - is one if the borrower's sales are between \$10 and \$100 million,
 - $MEDIUM$ - is one if the borrower's sales are between \$100 and \$250 million,
- and X^{con} contains control variables such as leverage ratio, log sales, loan maturity, and indicator variables for loan type (revolver versus term loan), industry and time.

We also run a regression combining all loans inside and outside of New England, with an additional variable NE as an indicator for loans to borrowers in New England. The coefficients of BBF and its cross terms can be used to gauge the impact of the merger.

Two-step Estimator

Additionally, we estimated a two-step model of loan interest spreads, to control for the potential endogeneity of a borrower's having a relationship with Fleet-BankBoston, where we allow the BBF indicator to be endogenous. If BBF is endogenous to borrower characteristics, that could produce selectivity bias and affect our estimates of the effects of BBF on interest cost.

⁵ Specifically, we run the regression with $BBF, BBF * SMALL, BBF * MEDIUM, POST * BBF, POST * BBF * SMALL, POST * BBF * MEDIUM$.

We model BBF_i as an outcome of an unobserved latent variable:

$$BBF_i^* = Z_i p + e_i \quad (2)$$

$$BBF_i = \begin{cases} 1 & \text{if } BBF_i^* > 0 \\ 0 & \text{if } BBF_i^* \leq 0 \end{cases} \quad (3)$$

where Z_i is a vector of exogenous variables including X^{con} . That is, the matching of borrowers to Fleet and BankBoston is not random and the factors that determine the matching potentially influence the all-in-spread, as well. As the middle-market borrowers are potentially spatially constrained, we include two exogenous distance variables, namely *DISTANCE* and *LONGITUDE* into the first-step Probit regression.

DISTANCE measures the mileage distance between the borrower and Fleet or BankBoston corporate headquarters in Boston and *LONGITUDE* is simply the longitude coordinate of the borrower's headquarter. In the second-step regression, appropriate hazard terms must be added to (1) and standard errors must be adjusted.⁶

⁶ Our framework produces the same estimation result as a switching regression with an endogenous selection equation. Under that framework, one assumes there are two underlying loan rate equations, one by BBF and the other by their competitors. The borrowers select one of the lenders based on an endogenous selection equation. Specifically, the problem can be expressed as follow.

$$\text{(BBF offer rate equation)} \quad SPREAD_i^b = X_{1i} b^b + u_i^b \quad (i)$$

$$\text{(Other offer rate equation)} \quad SPREAD_i^o = X_{1i} b^o + u_i^o \quad (ii)$$

$$\text{(Selection equation)} \quad BBF_i^* = X_{2i} h + a^b SPREAD_i^b + a^o SPREAD_i^o + v_i \quad (iii)$$

$$\text{(Observed rate)} \quad SPREAD_i = BBF_i \times SPREAD_i^b + (1 - BBF_i) \times SPREAD_i^o$$

$$BBF_i = 1 \text{ if } BBF_i^* > 0$$

$$= 0 \text{ if } BBF_i^* \leq 0$$

where X_{1i} is a vector containing exogenous variables that determine spread and X_{2i} is a vector containing exogenous variables that determine a firm's likelihood of borrowing from BankBoston and Fleet. Inserting (i) and (ii) into (iii), we can rewrite (iii) in reduced form as

$$BBF_i^* = X_{2i} p + e_i$$

3. Empirical Results

Table IV presents our main results. The first two columns are the OLS and two-step estimators for the all-in-spread in New England, whereas the last two columns are the corresponding results for loans outside New England. The control variables play an important role. The equity to total asset ratio, EA , enters the regressions significantly with the expected negative sign. The size of the borrowers, $LOGSALE$, is also significant and has a negative sign. Loans to financial companies, $FINANCE$, are priced significantly lower than otherwise similar loans to non-financial companies. The indicator variable for a revolver, $REVOLVER$, is also negative and significant.

where X_i contains all exogenous variables in (i) and (ii). To apply the two-step estimation procedure, consider the following expressions for conditional expectations of $SPREAD_i^b$ and $SPREAD_i^o$ given X_{it} and BBF_i^*

$$E(SPREAD_i^b | X_{it}, BBF_i^* > 0) = X_{it}b^o + X_{it}q_0 + E(u_i^b | X_{it}, BBF_i^* > 0)$$

$$E(SPREAD_i^o | X_{it}, BBF_i^* \leq 0) = X_{it}b^o + E(u_i^o | X_{it}, BBF_i^* \leq 0)$$

where we define $q_0 = b^b - b^o$ so that the null hypothesis of interest can be written as $H_0 : q_0 = 0$.

Assume joint normality of error terms, which is not required for consistency of two-step estimators, to write out hazard terms explicitly. We have

$$E(u_i^b | X_{it}, BBF_i^* > 0) = s_{vb}s_v^{-1}l(X_i\hat{p})$$

$$E(u_i^o | X_{it}, BBF_i^* \leq 0) = s_{vo}s_v^{-1}l(-X_i\hat{p})$$

where s_{vb} is the covariance between u_i^b and v_i , s_{vo} is the covariance between u_i^o and v_i , and s_v is standard deviation of v_i . The function $l(\cdot)$ is the inverse Mills ratio and \hat{p} is the probit ML estimate of \boldsymbol{p} from the first stage regression. The second stage regression can be implemented on all observations in the following OLS regression:

$$SPREAD_i = X_{it}b^o + (BBF_i \times X_{it})q_0 + q_i h_i + e_i.$$

$$h_i = \begin{cases} l(X_i\hat{p}) & ; BBF_i = 1 \\ l(-X_i\hat{p}) & ; BBF_i = 0 \end{cases}$$

However, the standard errors from the second-step regression are incorrect and need to be adjusted for the variation introduced by \hat{p} in the first stage Probit regression. The standard error adjustment for this problem is essentially that of the generated regressors framework that is treated extensively in the literature (see, for example, Wooldridge 2001 Chapter 6 and Heckman 1979).

In the OLS regression, we find that, before the merger, loans by Fleet and BankBoston to the small-sized segment of the middle market are priced on average 73 basis points lower than their competitors for otherwise identical loans to New England borrowers. The pre-merger discount is even greater, 97 basis points, for the middle-sized segment of New England's middle-market lending. We find that there is no discount for any category of middle-market borrowers outside New England before the merger.

This evidence is consistent with our conjecture that Fleet and BankBoston enjoyed an economy of scale in middle-market lending within New England. Competition between them, as the two largest lenders in the region, effectively forced them to pass on their efficiency advantages to borrowers. These advantages did not extend beyond their own regional market, as is shown by the results for loans outside of New England.

After the merger, the discount for the small-sized segment of middle-market borrowers remains little changed. For the medium-sized segment, however, the pre-merger discount completely disappears. This result clearly demonstrates the post-merger exercise of market power within New England, and shows that it only occurs within the middle-sized category of middle-market borrowers. The market for loans to small-sized borrowers is still competitive (as it contains many small banks), and the loan market for large-sized borrowers is competitive because those borrowers have access to national capital markets and to large banks in other regions.

It is also interesting that we observe a discount for small-sized BBF borrowers outside of New England after the merger. This finding does not come as a surprise when one considers that the merged entity increased its market share outside of New England

significantly after the merger. Interestingly, consolidation within New England was associated with aggressive pricing practices and expansion of lending outside New England. One way to understand that change is to consider the optimal policy of a bank enjoying a new monopoly in one region and competitive markets elsewhere, and allocating a fixed amount of equity capital (in support of lending) across the two market areas. New monopoly power in one market niche (New England middle-sized middle-market lending) leads the bank to contract lending in that niche and thus, expand lending elsewhere. (In the case of Fleet-BankBoston, its larger post-merger size may also have improved its ability to lend to large borrowers without concerns about excessive exposures to particular borrowers.)

The results from two-step regressions are similar to the OLS results, even though the pricing effects are slightly smaller for both pre-merger discounts and post-merger premiums. Table V shows the first-step regressions where we include the log of distance (in miles) between the borrower and Boston, *LDIST*, and the longitude of the borrowers, *LONGITUDE*. Our choice of these instruments reflects our belief that middle-market borrowers are spatially constrained and select their lenders partially based on their location. The similarity between the results from OLS and two-step regressions indicates that the endogeneity of the *BBF* variable does not affect pricing very much.

As a robustness test, we also run OLS and two-step regressions combining all loans from inside and outside of New England, together with an indicator variable for loans from borrowers within New England, *NE*. The results are similar, thus we report only OLS results in Table VI. In addition, we replaced discrete indicator variables for the

size of borrowers, which interact with *BBF*, with the continuous variable, *LOGSALE*. The results are qualitatively similar and are not reported here.

4. Conclusions

Our findings that Fleet and BankBoston offered pre-merger interest rate discounts to medium-sized borrowers in middle market lending in New England, and that the discount disappeared after the merger, indicate several important points. First, large banks seem to benefit from an economy of scale in middle-market lending. Second, the banking market can be very “competitive,” even when it is highly concentrated. Fleet and BankBoston competed away a full percentage point of their scale advantage prior to the merger, even though they were the only two large banks in New England.

After the merger, the combined entity controlled about half of the loans made to middle-market lenders in New England. Discounts on middle-sized middle market loans in New England disappeared after the merger, but not on small loans, indicating that competition remained strong for small borrowers (who could borrow from small banks as well as large ones), but that middle-sized middle-market borrowers in New England had limited alternatives to the combined Fleet-BankBoston entity.

Many advocates of the elimination of branching restrictions envisioned a new banking structure for the United States consisting of a competitive, nationwide branching system, dominated by several universal banks. While some regions have seen an increase in competition resulting from branching, others have not. In some regions, given the initial conditions of bank fragmentation, and the barriers to entry into new regions posed by an absence of a preexisting set of customer relationships, consolidation has resulted in

reduced competition in some regional loan markets, with New England being an extreme case.

Our results suggest that the Fed should expand its anticompetitive study of merger proposals to consider the lending side of the banking business, and should look at particular niches within the lending market, when examining anti-competitive effects of a merger. At a minimum, the equivalent version of a Herfindahl-Hirschman index for deposit markets should be calculated for middle-market loans in the areas in which the merger candidates are operating. The availability of loan data, such as those used in this paper, makes it easy to perform such an analysis.

Divestiture requirements should take into account the need to support a competitive lending market for middle-market borrowers. Doing so may require not only that the merging institutions divest some branches, but that they also divest a significant number of middle-market lending relationships. It is crucial that the divested assets and capabilities of the merging institutions be sufficient in size and scope to ensure that a large entrant would be interested in bidding on them. In the Fleet-BankBoston merger, this was not done. Instead, branches were spun off to small banks to ensure sufficient fragmentation of the deposit market.

Achieving a change in merger approval and divestiture policy will require more than regression evidence. Merger policy is also affected by political pressures brought to bear on regulators by banks and politicians. The failure to attract a large entrant as a purchaser of divested assets was not the result of the failure to anticipate the effects of the merger. One of the authors of this study (Calomiris 1999) acted as a consultant to the governments of Massachusetts and Connecticut prior to the Fleet-BankBoston merger.

Based on regression analysis on the pre-merger sample of middle-market borrowers in New England, he advised regulators, in an opinion filed on July 20, 1999, that:

The highest risk of costs to the public from this merger comes from the potential destruction of competition for middle market relationships. In these areas competition favors large banks because of economies of scale and scope. It is crucial, therefore, that a viable competitor of substantial size and technical capability be able to credibly bid for, and continue, a competitive large-scale bank (in particular, one with middle market lending capability) alongside the new merged entity.....

...the Federal Reserve Board's approach to measuring market concentration – which focuses on local deposit concentration – is fundamentally flawed and especially inadequate for measuring the potential effects on competition in particular bank niches (e.g., middle-market lending)....

The regressions indicate that Fleet and BankBoston currently possess significant cost advantages, which translate into more than a full percentage point relative to their competitors....in the absence of continuing competition by at least two such banks in the New England area, those cost advantages would not be passed on in the same way to bank customers, since competitive pressures would be lacking. If the two banks could combine, and if no new entrant with similar scale, scope, and geographic presence were to enter, significantly higher interest costs would result.

Despite that evidence, and despite much opposition from middle-market borrowers who feared that they would suffer higher rates from the merger, there was little chance of stopping Fleet and BankBoston from merging, or of forcing them to divest a large chunk of their middle-market business. According to some sources, Fleet, BankBoston, and some of the smaller banks that anticipated gains from being able to acquire some divested branches enlisted the help of influential members of Congress to pressure the Justice Department and the Fed to ignore arguments made by experts, middle-market borrowers, and state government officials that divestiture should be handled differently.

REFERENCES

- Calomiris, C.W. "Statement of Charles W. Calomiris, Ph.D." July 20, 1999.
- Calomiris, C.W. "Regulation, Industrial Structure, and Instability in U.S. Banking: An Historical Perspective" in *U.S. Bank Deregulation in Historical Perspective*, New York, Cambridge University Press, 2000, 1-92, originally published in Michael Klausner and Lawrence White (eds.), *Structural Change in Banking*, New York University, New York 1993, 19-116.
- Calomiris, C.W., Karceski, J., "Is the Bank Merger Wave of the 1990s Efficient? Lessons from Nine Case Studies," in Steven N. Kaplan (ed.), *Mergers and Productivity*, Chicago, University of Chicago Press, 2000, 93-178.
- Cetorelli, N. "Competition Among Banks: Good or Bad?" Federal Reserve Bank of Chicago, *Economic Perspectives*, 2Q 2001.
- Cetorelli, N. "Entry and Competition in Highly Concentrated Banking Markets" Federal Reserve Bank of Chicago, *Economic Perspectives*, 4Q 2002.
- Degryse, H., Ongena, S. "Distance, Lending Relationships, and Competition" Centre for Studies in Economics and Finance, Working Paper No. 80, March 2002.
- Evanoff, D., Fortier, D. "Reevaluation of Structure-Conduct-Performance Paradigm in Banking" *Journal of Financial Research*, I, June 1988, 277-294.
- Flannery, M. "The Social Costs of Unit Banking Restrictions" *Journal of Monetary Economics*, 13 (1984), 237-249.
- Heckman, J. "Sample Selection Bias as a Specification Error", *Econometrica*, 47, 1, January 1979, 153-162.

Hubbard, G, Palia, D. "Executive Pay and Performance: Evidence from the U.S. Banking Industry" *Journal of Financial Economics*, XXXIX, 1995, 105-130.

Jayarathne, J., Strahan, P. E. "Entry Restrictions, Industry Evolution and Dynamic Efficiency: Evidence from Commercial Banking" Federal Reserve Bank of New York, Research Paper No. 9630, August 1996.

Peterson, M.A., Rajan R.G. "The Benefits of Lending Relationship: Evidence from Small Business Data" *Journal of Finance*, 1994, 49, 3-37.

Peterson, M.A., Rajan R.G. "The Effect of Credit Market Competition on Lending Relationships" *Quarterly Journal of Economics*, 1995, 110, 406-443.

Wooldridge, J. M. *Econometric Analysis of Cross Section and Panel Data*, First Edition, MIT Press, October 2001.

Figure I

Size Distribution of Top Bank Holding Companies Headquartered in New England

The figure shows the total Commercial and Industrial Loans (in \$ Billion) of twelve largest bank holding companies in New England at the end of second quarter of 1999.

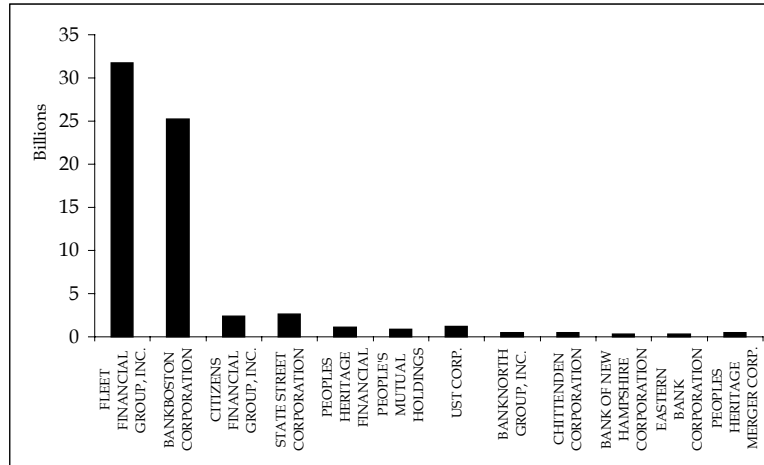


Table 1

Descriptive Statistics of the Sample Borrowers Included in the Regression Analysis

The sample data are loan facilities constructed from the Loan Pricing Corporation's DealScan database for borrowers located in the U.S. The pre-merger period is between 01/01/1997 and 06/30/1999. The post-merger period is between 01/01/2000 and 06/30/2002. The window period of 6 months - 3 months before and 3 months after the merger - are dropped from the sample. The sample borrowers have annual sales between \$10 - \$500 million USD with financial data available in COMPUSTAT or SEC filings and also have all-in-spread information available. The pre-merger sample consists of 235 and 1,826 loan facilities inside and outside of New England states respectively. The post-merger sample consists of 177 and 1,650 loan facilities inside and outside of New England states respectively. The variables are defined as follows:

MSALE	Borrower Sales Size in \$million
MDEALSIZ	Size of the Loan Facility in \$million
EA	Equity to Assets Ratio
MATURITY	Months to Maturity of Loan Facility
DISTANCE	Distance in Miles between Borrower Headquarter and FleetBoston Headquarter
LONGITUDE	Longitude Coordinate of Borrower's Headquarter
MANUF	Indicator Variable for Borrower in Manufacturing Industry
SERVICE	Indicator Variable for Borrower in Services Industry
FINANCE	Indicator Variable for Borrower in Financial Services Industry
REVOLVER	Indicator Variable for Revolver/Line of Credit Loan
SMALL	Borrower Sales between \$10m and \$100m Indicator
MEDIUM	Borrower Sales between \$101m and \$250m Indicator

Borrowers and Loans Characteristics	New England Borrowers						Outside New England Borrowers						All Borrowers					
	Pre-merger			Post-merger			Pre-merger			Post-merger			Pre-merger			Post-merger		
	Mean	Std Dev	Median	Mean	Std Dev	Median	Mean	Std Dev	Median	Mean	Std Dev	Median	Mean	Std Dev	Median	Mean	Std Dev	Median
MSALE	191.03	138.30	160.51	166.01	139.37	127.88	191.74	134.79	167.87	196.98	133.64	174.90	191.66	135.16	167.87	193.99	134.48	169.70
MDEALSIZ	100.05	169.28	40.00	86.01	154.97	27.90	127.19	228.50	55.00	171.62	340.340	80.00	124.10	222.67	50.00	163.33	327.97	75.00
EA	0.434	0.293	0.498	0.404	0.329	0.475	0.469	0.249	0.472	0.443	0.237	0.443	0.465	0.254	0.473	0.440	0.248	0.445
MATURITY	38	26	36	36	19	36	41	25	36	38	24	36	40	25	36	38	23	36
DISTANCE	52	63	21	83	211	26	1301	877	1117	1299	819	1151	1159	917	929	1181	860	1043
LONGITUDE	-71.67	1.04	-71.20	-72.14	3.82	-71.23	-93.78	16.99	-88.00	-93.62	16.00	-90.06	-91.26	17.47	-85.48	-91.55	16.53	-87.63
MANUF	0.493			0.485			0.398		0.342				0.409			0.356		
SERVICE	0.157			0.248			0.180		0.201				0.178			0.206		
FINANCE	0.076			0.062			0.173		0.155				0.162			0.146		
REVOLVER	0.689			0.621			0.685		0.602				0.686			0.604		
SMALL	0.331			0.446			0.336		0.305				0.336			0.319		
MEDIUM	0.471			0.305			0.343		0.367				0.342			0.362		

Table II

Total Loan Volume Extended to Borrowers Based in the U.S. by Sales Size

The table is constructed from DealScan database and includes all loans regardless of the availability of all-in-spread and balance sheet data. The loan is allocated to BankBoston or Fleet if either of these banks is the lead lender as identified by LPC or is the sole lender for the deal or holds the leading role in syndication with the following titles: administrative, syndication, or documentation agent. The volume numbers are in million dollar.

	Sale Size (\$Million)			Total
	10 -100	100 - 250	250 - 500	
Panel A: New England Pre-merger				
Fleet or BankBoston	1,423	4,605	5,450	11,477
- row %	12%	40%	47%	
- column %	22%	41%	40%	37%
Other Banks	5,076	6,584	8,243	19,902
- row %	26%	33%	41%	
- column %	78%	59%	60%	63%
All Lenders	6,498	11,188	13,693	31,379
- row %	21%	36%	44%	
Panel B: New England Post-merger				
FleetBoston	1,032	3,498	8,997	13,527
- row %	8%	26%	67%	
- column %	10%	52%	66%	44%
Other Banks	9,292	3,254	4,690	17,236
- row %	54%	19%	27%	
- column %	90%	48%	34%	56%
All Lenders	10,324	6,752	13,687	30,763
- row %	34%	22%	44%	
Panel C: Outside of New England Pre-merger				
Fleet or BankBoston	12,164	17,053	12,828	42,045
- row %	29%	41%	31%	
- column %	8%	9%	6%	8%
Other Banks	135,023	165,100	216,950	517,073
- row %	26%	32%	42%	
- column %	92%	91%	94%	92%
All Lenders	147,187	182,153	229,778	559,118
- row %	26%	33%	41%	
Panel D: Outside of New England Post-merger				
FleetBoston	17,523	20,207	28,059	65,788
- row %	27%	31%	43%	
- column %	15%	15%	15%	15%
Other Banks	102,874	114,998	156,648	374,520
- row %	27%	31%	42%	
- column %	85%	85%	85%	85%
All Lenders	120,397	135,204	184,707	440,309
- row %	27%	31%	42%	

Table III
All-in-Spread Characteristics of All Loan Deals by Borrower Sales Size

The table is constructed from all loan deals in DealScan database with all-in-spread information available. The loan is allocated to BankBoston or Fleet if either of these banks is the lead lender as identified by LPC or is the sole lender for the deal or holds the leading role in syndication with the following titles: administrative, syndication, documentation agent. The spread numbers are in basis point.

	Sale Size (\$Million)			Total
	10 -100	100 - 250	250 - 500	
Panel A: New England Pre-merger				
Fleet or Bank Boston				
- Average All-in-Spread	240	181	201	209
- Standard Deviation	87	96	131	107
- Number of Deals	73	65	51	189
Other Banks				
- Average All-in-Spread	289	228	198	246
- Standard Deviation	132	106	121	127
- Number of Deals	105	97	78	280
All Lenders				
- Average All-in-Spread	269	206	199	229
- Standard Deviation	117	104	126	120
- Number of Deals	178	162	129	469
Panel B: New England Post-merger				
Fleet or Bank Boston				
- Average All-in-Spread	245	228	222	229
- Standard Deviation	93	124	158	133
- Number of Deals	35	54	56	145
Other Banks				
- Average All-in-Spread	271	288	245	272
- Standard Deviation	109	179	99	133
- Number of Deals	137	65	46	248
All Lenders				
- Average All-in-Spread	266	261	230	255
- Standard Deviation	107	160	140	135
- Number of Deals	172	119	102	393
Panel C: Outside of New England Pre-merger				
Fleet or Bank Boston				
- Average All-in-Spread	259	223	211	235
- Standard Deviation	88	85	83	88
- Number of Deals	245	241	138	624
Other Banks				
- Average All-in-Spread	264	216	190	229
- Standard Deviation	114	99	106	111
- Number of Deals	2,594	2,122	1,727	6,443
All Lenders				
- Average All-in-Spread	264	217	192	230
- Standard Deviation	111	97	104	109
- Number of Deals	2,839	2,363	1,865	7,067
Panel D: Outside of New England Post-merger				
Fleet or Bank Boston				
- Average All-in-Spread	255	263	240	253
- Standard Deviation	82	103	102	96
- Number of Deals	199	187	181	567
Other Banks				
- Average All-in-Spread	288	270	247	271
- Standard Deviation	120	120	133	125
- Number of Deals	1,789	1,439	1,142	4,370
All Lenders				
- Average All-in-Spread	284	269	246	269
- Standard Deviation	117	118	129	122
- Number of Deals	1,988	1,626	1,323	4,937

Table IV

The Effects of Fleet and BankBoston Merger on All-in-Spread for Loans Made to Borrowers Inside and Outside of New England

The dependent variable in all regressions is the all-in-spread of the loan in basis point. The table reports the results from standard OLS and the second-step regressions of the two-step regression corrected for endogenous binary variable BBF, which indicates whether the lead lender of the loan is Fleet/BankBoston or not. The first-step Probit regressions of the two-step regressions are reported in Table VI. The construction of the sample and summary statistics of the sample are discussed in Table I. The standard errors are reported in parenthesis below the coefficient estimates. The independent variables are defined similarly to those in Table I with additional variables defined below.

BBF Indicator Variable equals one if BankBoston or Fleet is the lead lender as identified by LPC or is the sole lender for the deal or holds the leading role in syndication with the following titles: administrative, syndication, documentation agent

POST Indicator Variable for Observations form Post-merger period

LOGSALE Natural Log of Borrower Sales

MATURITY2 Square of MATURITY

YR2 - YR6 Year Dummies

Independent Variables	New England		Outside New England	
	OLS	Two-step	OLS	Two-step
Intercept	1060 *** (129.594)	984 *** (136.394)	912 *** (38.194)	904 *** (38.589)
BBF	30.650 (21.538)	-79.025 * (43.302)	8.912 (15.109)	-27.569 (26.492)
BBF*SMALL	-73.279 ** (29.831)	-58.094 ** (29.471)	16.207 (22.135)	14.860 (21.896)
BBF*MEDIUM	-97.268 *** (26.118)	-89.947 *** (25.154)	0.493 (18.648)	-0.196 (18.430)
POST*BBF	-10.046 (31.999)	10.996 (32.102)	-16.425 (19.247)	-15.044 (19.053)
POST*BBF*SMALL	8.974 (43.777)	-33.074 (45.432)	-48.529 * (29.227)	-47.599 * (28.879)
POST*BBF*MEDIUM	106.657 *** (40.099)	93.802 ** (39.114)	-0.547 (24.695)	-0.844 (24.391)
LOGSALE	-39.460 *** (6.871)	-32.930 *** (7.442)	-34.560 *** (1.990)	-34.089 *** (2.015)
EA	-120.239 *** (18.229)	-91.470 *** (21.790)	-64.343 *** (7.421)	-65.353 *** (7.468)
MATURITY	-0.106 (0.776)	0.006 (0.827)	-0.645 *** (0.224)	-0.521 ** (0.237)
MATURITY2	-0.001 (0.008)	-0.003 (0.009)	0.006 *** (0.002)	0.006 *** (0.002)
MANUF	17.251 (14.232)	-2.366 (16.551)	-1.572 (4.472)	-3.530 (4.636)
SERVICE	7.228 (17.133)	-9.494 (19.118)	4.275 (5.267)	3.037 (5.335)
FINANCE	-76.661 *** (23.573)	-101.642 *** (26.496)	-59.169 *** (5.651)	-57.747 *** (5.732)
REVOLVER	-40.643 *** (12.046)	-28.837 ** (13.463)	-29.805 *** (3.795)	-29.523 *** (3.810)
YR2	5.200 (15.644)	1.827 (16.633)	-7.832 (5.447)	-7.148 (5.479)
YR3	30.964 (22.300)	17.113 (24.182)	24.258 *** (6.549)	26.259 *** (6.677)
YR4	-27.592 (19.420)	-35.472 * (20.255)	36.226 *** (5.600)	37.321 *** (5.652)
YR5	27.275 (19.808)	5.807 (21.943)	48.152 *** (5.840)	49.968 *** (5.955)
YR6	5.842 (27.261)	-18.446 (30.030)	74.100 *** (7.361)	76.531 *** (7.523)
Inverse Mills Ratio		67.363 *** (23.151)		20.504 * (12.263)
Adjusted R ²	0.253	0.269	0.197	0.198
Number of Observations	412	412	3476	3476

***, ** and * denote significant difference at 1, 5, and 10 percent levels, respectively.

Table V
Combined Regression Measuring the Effects of Fleet and BankBoston Merger on
All-in-Spread for All Loan Made in the U.S.

The dependent variable is the all-in-spread of the loan in basis point. The table reports the regression for the combined observations both inside and outside of New England. The independent variables are the same as in Table IV with an addition variable NE equals one for New England borrowers. The result is from OLS with standard error in the parenthesis.

Independent Variables	OLS
Intercept	919 *** (36.595)
NE	22.462 *** 7.072
BBF	6.933 (15.214)
BBF*NE	31.415 23.376
BBF*SMALL	17.495 (22.288)
BBF*SMALL*NE	-74.63 ** 32.35
BBF*MEDIUM	0.657 18.798
BBF*MEDIUM*NE	-91.682 *** (30.168)
POST*BBF	-12.997 (19.380)
POST*BBF*NE	-46.439 32.367
POST*BBF*SMALL	-48.687 * (29.462)
POST*BBF*SMALL*NE	53.034 50.466
POST*BBF*MEDIUM	-0.225 (24.900)
POST*BBF*MEDIUM*NE	103.027 ** 45.241
LOGSALE	-34.608 *** (1.908)
EA	-72.828 *** (6.838)
MATURITY	-0.621 *** (0.215)
MATURITY2	0.006 *** (0.002)
MANUF	0.212 (4.270)
SERVICE	3.482 (5.029)
FINANCE	-61.251 *** (5.492)
REVOLVER	-30.790 *** (3.625)
YR2	-6.993 (5.143)
YR3	25.577 *** (6.281)
YR4	31.933 *** (5.379)
YR5	47.811 *** (5.595)
YR6	69.542 *** (7.109)
Adjusted R ²	0.204
Number of Observations	3888

***, ** and * denote significant difference at 1, 5, and 10 percent levels, respectively.

Table VI

First-Step Probit Regressions Predicting Firm Borrowing from FleetBoston

The table reports probit regressions predicting BBF - an indicator variable whether loan is made by Fleet or BankBoston. The predicted probability for BBF=1 is then used to construct inverse Mills ratio for second-step regressions reported in Table IV. The variables are defined as in Table I and IV with additional variables defined below.

LDIST	Natural Log of DISTANCE
LDIST2	Square of LDIST
LDEALSIZE	Natural Log of Deal Size
LDEALSIZE2	Square of LDEALSIZE
MA	Indicator Variable for Borrower in Massachusetts

Independent Variables	New England	Outside New England
Intercept	-9.044 (18.201)	-26.166 *** (9.882)
LDIST	-0.051 (0.235)	-5.028 *** (1.392)
LDIST2	0.042 (0.055)	0.385 *** (0.118)
MA	-0.080 (0.378)	
LONGITUDE	0.346 ** (0.163)	0.015 (0.011)
POST*LDIST	1.066 ** (0.429)	0.787 (1.997)
POST*LDIST2	-0.290 *** (0.098)	-0.064 (0.169)
POST*MA	-1.661 ** (0.713)	
POST*LONGITUDE	-0.344 (0.259)	-0.001 (0.016)
LOGSALE	0.055 (0.093)	-0.016 (0.041)
EA	0.917 *** (0.268)	-0.080 (0.135)
MATURITY	0.001 (0.010)	0.019 *** (0.005)
MATURITY2	0.000 (0.000)	0.000 *** (0.000)
MANUF	-0.520 *** (0.174)	-0.258 *** (0.081)
SERVICE	-0.325 (0.213)	-0.144 (0.092)
FINANCE	-0.377 (0.323)	0.152 (0.094)
REVOLVER	0.323 ** (0.156)	-0.004 (0.067)
YR2	-0.061 (0.189)	0.137 (0.102)
YR3	-0.330 (0.275)	0.266 ** (0.117)
YR4	-55.118 * (30.394)	14.618 (13.129)
YR5	-55.397 * (30.396)	14.739 (13.128)
YR6	-55.875 * (30.429)	14.844 (13.136)
Log Likelihood	-234.42	-1053.09
Pseudo R ²	0.168	0.114
Number of Observations	412	3476

***, ** and * denote significant difference at 1, 5, and 10 percent levels, respectively.