Does Size Matter? The Effects of Bank Mergers on Small Firm Financing across the United States

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In the 1950s Gurley and Shaw (1955) began emphasizing the role of intermediaries in the credit supply process. It is now well established that financial intermediaries have a fundamental role in determining the amount and distribution of credit to the economy. There is less agreement, unfortunately, about the precise way in which alternative structures of the banking industry manifest their influence on the economy. Recently, it has been shown that, by changing the behavior of lending institutions, monetary policy affects different groups of borrowers in different ways. In particular, Bernanke and Gertler (1995) have shown that, following a restrictive shock to monetary policy, the decrease in the amount of loans to small firms exceeds the decrease in the amount of loans to large firms. This is so because the increased riskiness of small firms during the periods of restrictive monetary policy causes banks to concentrate their loans on larger, more diversified firms. Since costs of direct financing are exceedingly large for small firms, they are unable to obtain credit directly, and their main form of outside financing remains the traditional banking industry. Thus, to the extent that banks are the main sources of loans for small firms, when banks change their behavior, small businesses face a decrease in the amount of loanable funds available to them and, as a result, a significant worsening of credit conditions.

In this paper, the relationship, if any, between the distribution of available credit to different groups of borrowers and the competitiveness of the banking industry will be explored. Specifically, the existence, for any given stance of monetary policy, of a positive relationship between the amount of loans to small borrowers and the degree of competitiveness of the banking industry is suggested. The intuition is that if many banks compete to finance small firms, then small firms will

have the option of switching lenders. That is, competition forces banks to absorb, at least in part the shock introduced into the market by an exogenous change in monetary policy. This implies that the existence of many banks may shelter small firms from the negative asymmetric effect of monetary policy, whereas a significantly concentrated banking industry may penalize them more than large firms. If a positive relationship exists between banking concentration and the amount of loans to small firms, then the recent wave of bank mergers may be harmful to the growth and development of small businesses.

In the rest of the paper, section I describes the current merger wave in the U.S. banking industry and evaluates advantages and disadvantages of such a trend on the economy. Section II describes the data and the methods used for testing the hypothesis. Section III presents and analyzes my results. Section IV concludes the paper.

I. The Merger Wave in the U.S. Banking Industry

From 1934 until the mid 1980s, the number of banks in the United States remained fairly stable (see Appendix A). In the 80s, however, the number of banks in the U.S. began decreasing significantly. Between 1980 and 1994 the number of banks declined from 14,404 to 10,357. A decrease of 28 percent.[1] The two main causes of such a decline are bank failures and bank mergers. Statistics show that, between 1985 and 1992, failures contributed significantly to the decrease in the number of banks. Still, they actually accounted for less than half of the 3000 bank drop. Since 1992, the number of bank failures has accounted for less than 15 percent of total decline in the number of banks[2] The remaining part of the reduction can be explained by the growing trend towards larger banks and bank consolidation.

Why are so many bank mergers taking place? Like any other firms, banks act to maximize profits. The primary motive for consolidation is the maximization of shareholders'

value. There are, indeed, a number of advantages to consolidation. To start, the increase in size allows banks to take advantage of economies of scale. An example of economies of scale would be a reduction in the transactions cost of ATM withdrawals. Second, larger bank portfolios allow greater diversification and consequently less risk. Last, mergers create opportunities for the exploitation of economies of scope, for example the issuance of commercial paper. Until 1980, the MacFadden Act significantly limited bank mergers. But, when interstate restrictions on banking began being relaxed, banks quickly realized the potential advantages of merging. By interacting with institutions headquartered in different states, for example, a bank is less likely to suffer from a recession since a more geographically dispersed borrower base is more diversified and, therefore, less risky. Merging with other banks also allows a bank to increase market share and perhaps take advantage of new and expensive technology, thereby improving customer satisfaction.

The Federal Reserve has been generally favorable toward mergers. In particular, the Fed seems to view bank mergers as the natural result of economic growth and of the general trend toward increased globalization. Such a trend, of course, encourages banks to merge in order to compete with their international rivals. In addition to several benefits, bank mergers are also subject to some risks. Unlike the Fed, Congress expressed concern about all mergers taking place, particularly with respect to their effect on customers. For example, Congress is concerned with the possibility of rising fees and lower investments in low-income communities.[3]

Although there is no easy way to measure the opportunity costs of bank mergers, it is reasonable to assume that their worst risks are associated with the transition period and with the difficulties associated with combining different management teams, techniques, and work place habits. If the transition does not take place smoothly, services could be interrupted causing

dissatisfied customers to choose other banks. Also with respect to small business lending, the knowledge and information used by loan officers and bank managers is very important. Thus, while increasing portfolio diversification, tapping into new areas also means additional work that can be very complicated for someone lacking specific experience. Indeed, aside from technological and managerial issues, the most important possible drawbacks of bank consolidation may exist at the local level and with respect to small firm financing. The larger size of banks may, in fact, lead to larger loans given to fewer customers thereby increasing the risk of bank failures. Furthermore, the decrease in the number of small banks may reduce the amount of small business loans. The possibility of larger loans reduces the cost of loans and, consequently, reduces the amount of loanable funds available to small business borrowers. Specifically, increasing detachment between decision making and the local environment reduces the usefulness, and increases the costs, of establishing long term customer-bank relationships. As a result, an increase in the size of banks may reduce the amount of information about small businesses thereby increasing adverse selection and moral hazard. According to my hypothesis, the outcome of such a reduction in information is an increase of informational asymmetry and a further reduction in the amount of loans allocated to small businesses.[4]

Some work already exists on this subject. Peek and Rosengreen (1998) find that in New England both small and very large banks (more than $3 billion in assets) have experienced significant asset growth of 24 percent. However, growth in small business loans diverged sharply with large banks increasing their lending by 3% and small banks (less than $100 million in assets) increasing their lending by 42%. This concrete evidence seems to support my hypothesis. As an explanation for such an asymmetry, Peek and Rosengreen (1998), suggest that small business lending may be less profitable than activities that exploit size and scope. Lending has

increased most in the loan categories from $100,000 to $1 million for small banks, largely because the increase in size means more access to this sector. Very large banks have increased their small business lending in the loan category of less than $100,000. This seems to be because they are better able to take advantage of the operational savings generated by the increasingly popular credit scoring models. Borrowers with substantial assets and a good credit rating are likely to be able to borrow less expensively than in the past. In contrast, borrowers with a good idea, but poor credit rating and little collateral are likely to face higher costs.

The goal of this project is to complement Peek and Rosengreen's (1998) work and test in an alternative way the existence of a negative effect imposed by the merger trend on small borrowers across the United States. Following a standard profit maximizing behavior, when the government implements a restrictive monetary policy, banks and firms of different size modify their lending and borrowing behaviors, in order to adapt to the restrictive monetary policy implemented by the government. Such a behavioral change, however, is not the same across banks and firms. Differences depend, to a large extent, on firm and bank size. In particular, we would expect small firms and start-ups, which are traditionally perceived as being riskier, to end up being penalized relatively more than large firms. Since bank lending represents their primary source of funding this represents a significant problem. So, the effects of changes in monetary policy on small firms may be substantial. If the penalty is strong enough, or sufficiently widespread, the destabilization suffered by small firms may spread to labor markets and to the whole economy with potentially disastrous results.

II. Data and Hypothesis Testing

The purpose of this study is to test empirically the hypothesis that the bank merger trend is detrimental for small business borrowers across the United States

FDIC and FFIEC data are used to perform all tests.[5] Because of their sources, data are comprehensive and relatively reliable. Of course, more satisfactory information would come from the analysis of banks' loan portfolios. Unfortunately, although such data are collected by the Federal Reserves, they are not available to the public.

First, the existence of a merger trend in the United States was documented. Indeed, a simple plot of time series representing the number of banks and the number of bank branches, from 1935 to 1995, is sufficient to show a clear tendency for the number of banks to decline and for the number of branches to increase. (See Appendix A)

Second, the degree of concentration in the banking industry was estimated. To this purpose, the Herfindahl-Hirschmann Index (HHI) was calculated for each of the 50 states. The index is simply the sum of squares of the market share of each bank in the given market. The market share of each bank is measured by dividing the amount of deposits in one bank by the total amount of deposits in each state. If the HHI is less than 1000, the concentration in that region is low. If the HHI is greater than 1000 and smaller than 1800 there is moderate concentration. Finally, if the HHI is higher than 1800, there is high concentration. In the limit case of a banking monopoly the HHI equals 10,000.

Appendix B contains the HHI for all states. In the majority of the states there is low concentration in the banking industry. Only five states show above average banking concentration and have HHI very close or mildly exceeding 1800. These results suggested the strong possibility of the hypothesis being rejected, at least in its original formulation. That is, when banking concentration is measured by considering the number of banks rather than the number of branches. Of course, since the purpose of this study is to assess a possible negative

effect of bank mergers on small firm financing, the number of banks must be considered and not the number of branches.

Third, a possible relationship between the HHI and the amount of loans to small businesses was tested for. (See graph in Appendix B) to this purpose an ordinary least square regression was run.

The testable hypothesis is:

> Ho: The HHI does not have a significant negative effect on the amount of small business loans being made in the United States.
>
> H1: The HHI has a significant negative effect on the amount of small business loans being made in the United States.

Tests were run at a five-percent significance level in a one tailed test. Appendix C shows all the regression results. At a five- percent significance level, the p-value must be less than 0.05 to indicate a significant negative effect of the HHI on the amount of loans to small businesses. A regression of the relationship between the two variables produced a p-value of 0.560, indicating that there is no significant negative effect between the HHI and the amount of loans to small businesses. Thus, the null hypothesis, the absence of significant negative relationship, cannot be rejected. To summarize, small business borrowers across the United States are affected by the current merger trend in different ways. The strengths and direction of the effects seem to depend on where they are located.

III. Analysis of Results

All results and calculations can be found in Appendices B and C. In most of the states: lower HHI imply a greater amount of loans to small businesses or higher HHI imply a lower amount of loans to small businesses. Nevertheless, the strength of the connection between these

two variables and the regression analysis shows that there is no significant negative effect between the two variables.

The hypothesis does not work in the case of the following states among others: Arizona, Delaware, Hawaii, Rhode Island and Washington. For all these states a moderate or high concentration in the banking industry is observed. It is also observed that a significant amount of loans to small businesses are being granted. This implies that the bank merger trend does not have a negative effect on small business borrowers in these states. The main reason for this observation is the fact that even though the number of banks is decreasing significantly, the number of branches is drastically increasing. With the number of branches continuously increasing, banks are able to efficiently and effectively gather accurate information about potential borrowers, thereby reducing the problems related to asymmetric information (i.e., moral hazard and adverse selection) and significantly reduce the banks' credit risk. If the network of branches is capillary the decision making power remains at the local level, therefore valuable, long term relationships between banks and their customers can be developed.

Indeed, the loyalty of small businesses to banking institutions in their area is important. The majority of all small businesses, about 96 percent, use just one bank for all of their financial needs, including deposits, borrowing and other services (Simmons and Simmons 1998). This loyalty among small businesses and the importance of "relationship banking" to both parties potentially overrides the merger consolidations. The wealth of information that a local bank would have about businesses in the region would make those institutions more willing to loan money to businesses by better estimating their riskiness. These trends tend to indicate that small regional banks actually increase their small business loans after a merger, again probably as a result of the diversification of their loan portfolio and the better information on local borrowers.

The hypothesis is not rejected when the HHI index is low as, for example, in California and New York. In these and other states there are a significant amount of loans being granted to small businesses. This is supported by economic theory according to which competition increases the quality of services offered for any given price.

The opposite is also true, for example in Alaska, Nevada, and Wyoming. In those states, the decline in banking competition decreases the availability of small business loans. Because an increase in the size of banks may lead to less information being known about the potential customers, increasing the distance between decision making and the local environment prevents long term customer-bank relationships from being established. Consequently, the problems caused by asymmetric information are increased, i.e. moral hazard and adverse selection, and the likelihood of loans being made to small businesses is further reduced.

Finally, the emergence of many non-bank financial companies competing with traditional institutions is also important in explaining the results. These firms, which, among others, include mutual funds and brokerage firms, provide certain features such as check writing and credit cards that allow depositors easy access to funds while paying higher returns (Simmons and Simmons 1998). Under these circumstances, their existence provides a strong incentive for banks to remain competitive.

A possible expansion of this study would be to investigate the hypothesis by looking at the average size of banks in each state and taking that information into consideration in the analysis. Also, it would be desirable to calculate the ratio of small loans to assets. This ratio is a good indicator of banks' behavior with respect to small business loans. A low ratio would suggest that the banks are using only a small proportion of their assets in funding small business loans. Likewise, a high ratio would indicate a high proportion being used in this manner. The ratio

would then be used to replace the amount of money provided for small business loans. Last, to more accurately analyze the relationship between the HHI and the amount of loans to small business throughout the United States, it would be desirable to take into account demographics of each state as well as the structure of its economy and the business environment. Thus, further research is needed to assess the significance and robustness of the results.

IV. Conclusion

In this paper, the extent to which, if at all, concentration in the banking industry contributes to the differential treatment of borrowers of different sizes, was analyzed. The hypothesis was that the higher the degree of concentration of the banking industry, the higher the penalty imposed on small firms. According to the literature, we would expect the recent wave of bank mergers to penalize small firms that do not have access to alternative ways of financing, more than larger ones. This hypothesis was tested by using detailed bank data from the FDIC and the FFIEC for the U.S. The results are, of course, purely suggestive and do not apply in the same ways across all the fifty States. In general, the recent merger trend in the United States does not seem to have a significant negative effect on small firm financing.

While confirming the existence of a credit channel of monetary policy, the argument and results presented in this paper, also introduce symmetry in the range of its possible effects. In line with traditional theories, competition in the banking industry is shown to possess stabilizing properties. In particular, a high degree of banking competition is shown to be especially useful when the development of small firms is desired. Banking competition, however, is not defined on the bases of the number of banks, but on the basis of the number of branches. As long as the number of bank branches in any specific location remains sufficiently high, bank mergers, and the resulting increase of the HHI, do not pose a threat for small firms. In fact, in the United

States, although many banks are merging, 92 percent of FDIC insured banks are still classified as small community banks. (Cunningham, 1998) However, small banks do feel the competitive pressure of larger banks. While larger banks can afford to invest in technology and offer services more convenient to the customer, smaller banks usually do not have the resources to fund such improvements. This could cause small banks to lose customers who prefer the additional services offered by merged banks. As a result, to maintain their market share, small banks may have to focus on personalized service. In other words, small banks must capitalize on all opportunities to establish new long-term customer relationships. Even more than in the past, small firms could fill this niche.

The results may be different across the United States because the banking concentration index does not capture sufficiently the structure of the banking industry. In particular, what matters in determining the amount of credit available to small firms is not the number of banks but, rather, the number of branches. The number of branches, and their distribution across a state, determines how capillary the credit system is and what knowledge banks have of local business conditions. In other words, the number of local branches determines if the conditions for the establishment of long term bank-customer relationships exist. Although the concentration index may be high, a large number of branches generate a high degree of competition. Under those circumstances, banks cannot extract monopolistic rents. On the contrary, the high likelihood of customer switching forces them into sheltering firms that would, otherwise, suffer from a rationing problem.

In summary, the availability of specific information and banking competition may be the key determinants of the amount of credit available to small borrowers. They also show that when measuring banking competition, how branches are distributed and how capillary the financial intermediaries are, is at least as important as the number of banks. Finally, a highly competitive

banking industry may be particularly desirable in areas where small businesses absorb a significant percentage of the labor force or in more rural areas where the settling of large companies is less likely. The policy implications of such a conclusion are certainly worthy of further investigation.

APPENDIX A

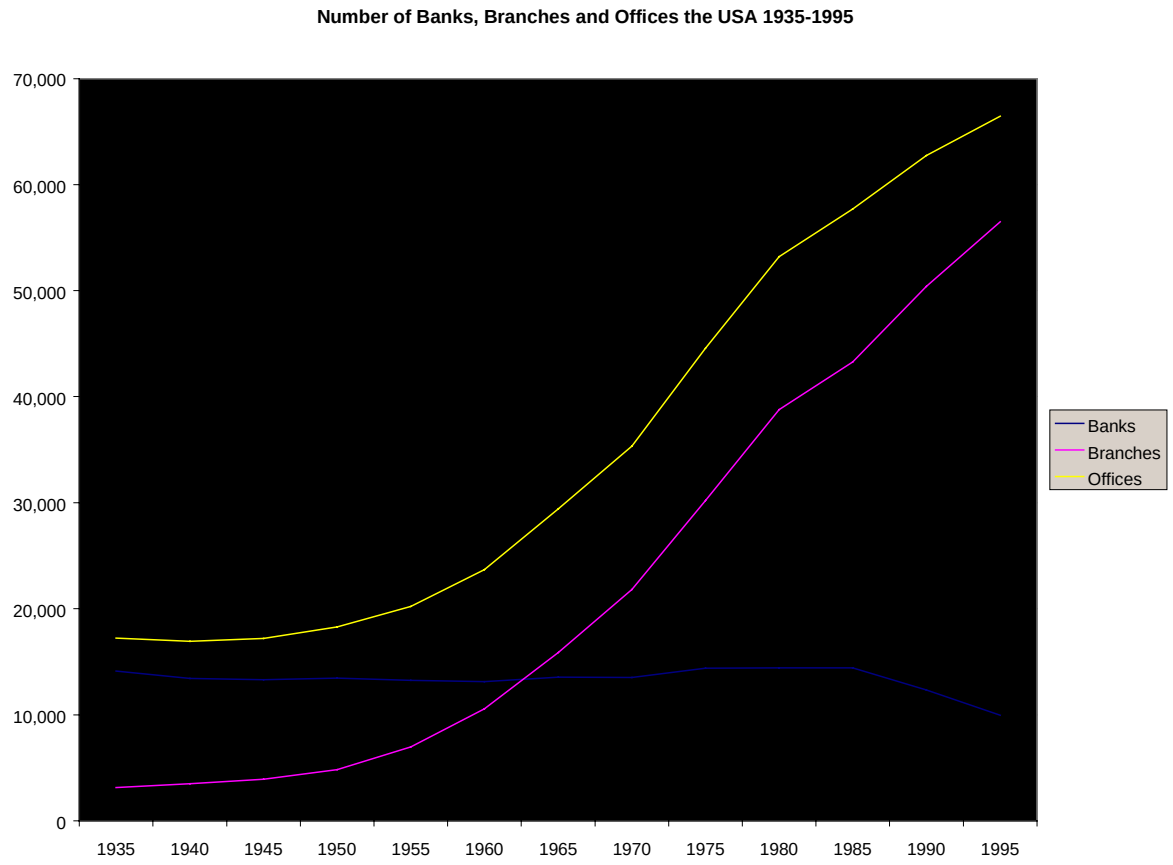

Figure 1: Number of banks and branches in the US 1935-1995

APPENDIX B

Bank Concentration – The Herfindahl Hirschmann Index (HHI)

The index is simply the sum of squares of the market shares for the banks in the market. Market share is measured by the amount of demand deposits in one bank divided by the total amount of demand deposits in each state.

Range of Concentration:

0-1000: low concentration
1000-1800: moderate concentration
1800+ high concentration
10000 (maximum) monopoly

STATE	HHI Index (June 30,1998)	Loans to Small Businesses (December 31, 1998) Amount in 000's of Dollar
Alabama	945	13,421,953
Alaska	2650	765,821
Arizona	1802	2,910,461
Arkansas	162	2,731,672
California	829	100,218,106
Colorado	582	2,946,580
Connecticut	984	501,297
Delaware	1487	2,683,667
District of Columbia	1561	237,835
Florida	689	13,479,878
Georgia	553	10,318,575
Hawaii	2107	4,373,798
Idaho	1776	235,184
Illinois	261	49,212,342
Indiana	308	10,208,486
Iowa	195	4,737,859
Kansas	241	3,852,525
Kentucky	323	6,185,334
Louisiana	695	6,632,869
Maine	940	776,061
Maryland	649	4,614,853
Massachusetts	927	26,938,227
Michigan	795	28,811,046
Minnesota	735	24,684,897
Mississippi	692	3,456,623
Missouri	437	7,220,326
Montana	608	1,065,595
Nebraska	351	2,747,678

Nevada	1325	582,956
New Hampshire	1025	842,926
New Jersey	608	12,139,619
New Mexico	675	1,072,230
New York	759	178,035,436
North Carolina	1171	68,311,126
North Dakota	442	1,037,325
Ohio	387	35,891,658
Oklahoma	243	4,472,031
Oregon	1462	800,629
Pennsylvania	720	50,252,621
Rhode Island	3095	19,231,760
South Carolina	661	2,033,454
South Dakota	572	2,667,315
Tennessee	559	10,679,321
Texas	378	39,600,142
Utah	1344	4,651,535
Vermont	884	683,116
Virginia	769	6,728,051
Washington	1095	1,840,369
West Virginia	328	1,760,095
Wisconsin	201	11,365,942
Wyoming	1719	668,087

Source: http://www.fdic.gov
http://www.ffiec.gov

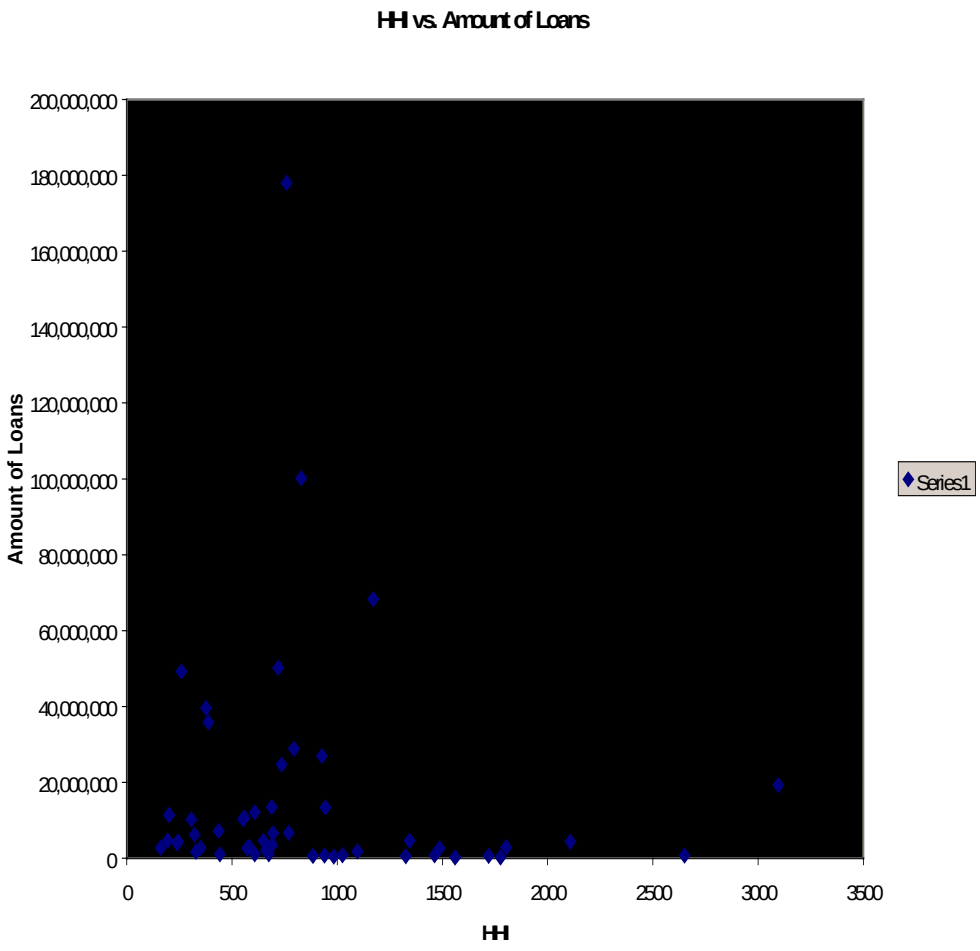

Figure 2: Herfindahl Hirschmann Index versus Amount of Loans

APPENDIX C: Regression Analysis

The regression equation is *Loans =19089246 - 4076 HHI*

	Coef	StError	T	P
Constant	19089246	7429467	2.57	0.013
HHI	-4076	6939	-0.59	0.560

S = 30467600 R-Sq = 0.7% R-Sq(adj) = 0.0%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	3.20366E+14	3.20366E+14	0.35	0.560
Reg. Error	49	4.54855E+16	9.28275E+14		
Total	50	4.58058E+16			

Unusual Observations

Obs	HHI	Loans	Fit	StDev	Residual	StResidual
2	2650	765821	8287099	1302398	-7521278	-027X
5	829	100218106	15710008	4279077	84508098	2.80R
33	759	178035436	15995348	4343636	162040088	5.37R
40	3095	19231760	6473154	15973213	12758606	0.49X

R denotes an observation with a large standardized residual
X denotes an observation whose X value gives it large influence.

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[1] http://www.fdic.gov

[2] http://www.fdic.gov

[3] Georges Mannes (1998) reports that Edmund Mierzwinski, Director of the U.S. Public Interest Research Group argued that “bigger banks mean bigger fees”. In fact, a Federal Reserve survey performed in 1997, supports Mierzwinski’s claim. The survey “found that fees were significantly higher at banks which operate in several states than they were in single state banks”.

[4] According to the economic theory, as a result of the decrease in competition, an increase in the cost of loans to small borrowers is also expected.

[5] Specifically, both data set used are available on the Internet at http://www.fdic.gov and http://www.ffiec.gov