Acquistion Targets and Motives in the Banking Industry

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This paper uses a large sample of individual banking organizations, observed from 1996 to 2003, to investigate the characteristics that made them more likely to be acquired. We use a definition of acquisition that we consider preferable to that used in much of the previous literature, and we employ a competing-risk hazard model that reveals important differences that depend on the type of acquirer. Since interstate acquisitions became more numerous during this period, we also investigate differences in the determinants of acquisition between in-state and out-of-state acquirers. The hypothesis that acquisitions serve to transfer resources from less efficient to more efficient uses receives substantial support from our results, as do a number of other relevant hypotheses.

Acquisition Targets and Motives in the Banking Industry

1. Introduction

Of the roughly 7,600 commercial banking organizations in the United States in 1995, a substantial number had disappeared as independent entities by 2003. Bank failures have been quite rare in recent years, in contrast to the situation in the 1980s and early 1990s. Thus, the vast majority of the reduction since 1995 was due to acquisitions of banks rather than bank failures. The period since the mid-1990s is also unique in that it marks the first time that geographic restrictions on the operations of banking organizations were largely nonexistent. Many intrastate restrictions on bank operations had been relaxed by the beginning of the period, and easing of interstate restrictions soon followed. A particularly important development was passage of the Reigle-Neal Act of 1994, which was fully implemented by mid-1997. This Act relaxed previous restrictions on interstate banking operations, allowing acquisitions and mergers across state lines on a nearly universal basis.

Given the large number of mergers that took place in the late 1990s and early 2000s and the unique characteristics of the time period, this study employs a large sample of independent banking organizations, observed annually, to investigate the characteristics that influenced the likelihood of a bank being acquired during the period from 1996 to 2003. Since this is the first study that uses data recent enough to include a substantial number of interstate acquisitions, it is the first to investigate whether the determinants of interstate acquisitions differ meaningfully from the determinants of intrastate acquisitions.

Following Wheelock and Wilson (2000), we use a competing-risk proportional hazard model to estimate the relationships between various bank and market characteristics and the "hazard" of being acquired. In our study, however, acquisition by differing types of acquirers, classified according to the location and size of the acquirer, define the competing risks. This approach provides a natural framework for investigating the determinants of out-of-state acquisitions, since acquisition by in-state and out-of-state acquirers may be modeled as competing risks.

An additional advance concerns the definition of an acquisition. We employ the widely accepted, but seldom implemented, standard that an acquisition occurs when there is a change in control. The use of the "change-in-control" standard means that the case of a bank holding company (BHC) acquiring an independent commercial bank or another BHC is counted as an acquisition, even when newly acquired bank institutions are operated as separate subsidiaries and not merged into an existing banking subsidiary of the acquiring holding company. Also, mergers of two banks owned by the same BHC are not counted as acquisitions, since presumably no (or very little) change in control occurs in such transactions. Past studies that have used large samples of banks (e.g., not samples composed of a select group of publicly traded banking organizations) to investigate acquisition likelihoods have typically excluded the former and/or included the latter type of transactions, presumably because the data required to use the "change-in-control" standard were not available in a useful format for earlier time periods.

The plan of the paper is as follows: Section 2 discusses the relevant literature. Section 3 presents a framework for looking at the likelihood of acquisition and discusses the explanatory variables employed in the analysis. Section 4 presents the empirical

model, while section 5 discusses data sources and procedures. Section 6 presents econometric results, and a final section summarizes the many findings of the analysis.

These findings conform reasonably well to prior expectations, and modeling the prospect of acquisition in terms of competing risks of acquisition by different types of acquirers reveals some interesting distinctions that would be masked by a more aggregated treatment.

2. Relevant Literature

Although various past studies have investigated the characteristics of banking organizations that make them more likely to be takeover targets, none use a comprehensive sample of acquisitions defined as a change in control, and nearly all employ data for periods that precede the last ten years.

Employing a sample of Texas banks in existence in 1970, Hannan and Rhoades (1987) report that banks that have larger market shares, maintain lower capital to asset ratios, and operate in urban areas were more likely to be acquired, all else equal. They do not find evidence that firms exhibiting lower profitability or growth were more likely to be acquired. Thus, to the extent that profitability and growth indicate managerial performance, they fail to find support for the hypothesis that poorly managed banks are more likely to be acquired than well managed ones. Amel and Rhoades (1989), however, using a large nationwide sample of mergers occurring during the years 1978 to 1983, do find that the lower a bank's earnings, the more likely it was to be acquired.

Using a sample of 84 banks that were acquired during the years 1982-1992 and a matched sample of 84 banks that were not acquired, Hadlock, Houston and Ryngaert

(1999) find no relationship between earnings and the probability of acquisition. The major focus of their study is the ownership structure of potential acquisition targets. They report that the probability of being acquired is lower when the bank's managers had a larger ownership stake, and the authors suggest that this reflects a tendency on the part of entrenched managers to block acquisitions that could be relatively profitable to other owners.

Another examination of bank acquisition likelihoods was reported by Moore (1997), who based his analysis on acquisitions (most likely restricted to actual mergers of financial institutions) that transpired between June 1993 and July 1996. Like Hannan and Rhoades (1987), Moore employed a multinomial logit estimation procedure to investigate whether the relationship between the likelihood of acquisition and its determinants differs, depending on whether or not the acquiring institution is located within the market in which the target bank operated. For both types of acquisition, Moore reports that the target bank's share, profitability (as measured by return on assets), and capital-asset ratio were all negatively related to the likelihood that a bank is acquired. The negative and significant coefficient of profitability is interpreted to be consistent with the hypothesis that acquisitions serve to transfer assets from poorly managed to better managed firms. Moore (1997) suggests that the coefficient of the capital-asset ratio is significantly negative for much the same reason, since it reflects past profitability. Only the coefficient of market concentration indicates a major difference in explaining the likelihoods of the two types of acquisition. This coefficient is significantly positive for

out-of-market acquisitions but negative for in-market acquisitions—a finding that Moore

suggests reflects antitrust restrictions on horizontal mergers,[1]

A common problem faced by previous large-sample studies is that the

unavailability of data indicating change in control typically restricts the analysis to cases

in which two separately chartered banks merge into one commonly chartered bank and

excludes all acquisitions by BHCs in which banking subsidiaries are not combined as part

of the transaction. An additional shortcoming of this approach is that mergers among

banks owned by the same BHC may be included in the sample. To avoid this latter

problem, Moore (1997) restricted the sample to independent banks and banks owned by

one-bank holding companies. It is not clear, however, whether the acquisition of a

banking institution by a BHC that subsequently allowed it to continue operating as a

separate institution under the holding company umbrella was treated as an acquisition.

The most sophisticated of the large-sample studies of the determinants of bank

acquisition likelihoods was conducted by Wheelock and Wilson (2000). This study uses

a competing-risk proportional hazard model to investigate the determinants of both the

likelihood of being acquired and the likelihood of failing (a competing risk). The sample

consists of about 4,000 banks followed over the period from 1984 to 1994. Of these,

1,380 were acquired and 231 failed at some time during the period.

That part of the paper that relates to the prospects for being acquired is of primary

relevance to this study. Like most studies, the authors find a bank's capital-asset ratio to

be inversely related to the likelihood of acquisition—a result they attribute either to the

possibility that banks with low capitalization are generally close to failure and therefore

more likely to be acquired, or to the possibility that banks with low capitalization are

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[1] Hannan and Rhoades (1987) offer this explanation for a similar finding in their study.

attractive to acquiring banks with managers who are able to operate successfully with high leverage. They also find a negative relationship between the likelihood of acquisition and the return on assets—a result often interpreted as supporting the hypothesis that acquisitions serve to transfer assets from poorer to better management. Wheelock and Wilson (2000) devote considerable effort to the construction of detailed measures of cost and technical inefficiency. They find significant negative coefficients of a measure of cost inefficiency and statistically insignificant coefficients of two other measures of inefficiency. Thus, the coefficients obtained for these inefficiency measures do not appear to provide support for the hypothesis that acquisitions serve to transfer assets from poorly managed to better managed organizations. On the whole, their findings regarding this hypothesis appear to be somewhat mixed.

As in other large-sample studies of bank acquisitions, data availability lead Wheelock and Wilson (2000) to restrict their analysis to combinations in which one chartered banking organization is absorbed into another. This treatment is particularly understandable in the case of their study, which focuses on the question of why banks disappear (either through failure or merger). The authors readily note, however, that this approach raises the two potential problems noted above: combinations of commonly-owned banks may be included, and acquisitions by BHCs or banks are not counted if the acquired banking institution is thereafter operated as a separate entity

These sample selection problems are typically avoided in studies that focus on small subsets of publicly-traded banking institutions, since the authors of such studies can employ data sources that provide information on acquisitions defined by the change-in-control standard. A recent example is a study by Akhigbe, Madura, and Whyte (2004),

which employs data on 254 acquisitions occurring between 1987 and 2001 and a matched sample of 582 institutions that were not acquired. That part of their study that examines the determinants of acquisition likelihoods reports that the probability of a bank being acquired is greater if it has a lower return on assets, more assets, and a higher capital-to-assets ratio. The finding regarding size is opposite to that reported in many other studies, and this is the only study that we know of that reports a positive relationship between capital levels and the likelihood of acquisition. The focus on organizations that are publicly traded (invariably quite large relative to the size of the typical bank) or perhaps the focus on acquisitions that satisfy the "change-in-control" criterion may account for these different findings. Our use of a very large sample of bank organizations that includes the vast majority of banks that are not publicly traded, while also incorporating the "change-in-control" standard for acquisitions, may help shed light on the differences between the findings of this paper and others.

A recent study by Rosen, Smart, and Zutter (2005) also sheds some light on target characteristics that may influence the likelihood of acquisition. Their sample includes a group of banks or BHCs that had an initial public offering between 1981 and 2002 and a group of similar banks and BHCs that did not. The authors conduct logistic regressions and do not find that institution size, return on assets, equity-to-assets ratio, or bank age are significantly related to the likelihood of being acquired. As in the case of Akhigbe, Madura, and Whyte (2004), the unique nature of their sample suggests that their results may not be broadly relevant for the entire banking industry.

3. Potential Determinants of Acquisition

In assessing the influence of various bank and market characteristics on the likelihood that an acquisition will take place, we take the view that underlying each acquisition is a difference in valuation between the current owner and the prospective acquirer. These valuations, of course, reflect the discounted values of future cash flows as the two parties perceive them to be under their management. The potential acquirer's assessment will depend not only on its perceived ability to manage the acquired assets, but also on any perceived advantages or disadvantages that may result from combining the assets of the acquiring and target firms under the joint control of the acquiring firm's management.

In light of this underlying view, it is useful to consider the likely impact of characteristics traditionally included in empirical investigations of bank acquisition likelihoods. Consider first the level of concentration of the market in which the target bank operates, included as an index of market power. For a potential acquirer that does not currently operate in the market of the target bank, it is unclear why high concentration would make an acquisition more likely, unless the acquirer thinks that it can exploit that market power more efficiently than the existing owners. Simply operating more efficiently, as acquirers typically believe they can do, does not mean that they can thereby benefit more from the exercise of market power. Indeed, as Rotemberg and Saloner (1987) show, the firm with market power benefits less from a reduction in costs than the firm without it.[2] If the potential acquirer operates in the same market as the target,

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[2] The underlying reason is that a significant cost advantage in a less concentrated market allows a firm to attract more customers from other firms than in the case of a more concentrated market. Rotemberg and Saloner (1987), Hannan and Berger (1991), and Hannan (1994) use this analysis as an explanation of why prices tend not to change as readily in more concentrated industries and markets.

however, then the prospect of enhanced market power, assuming the acquisition can obtain regulatory approval, may cause the acquirer to bid more than the minimum that the target is willing to accept   These potential differences in incentives faced by acquirers that operate within and outside the market of the target will be addressed in the empirical analysis reported below.

Assessing the role of the target firm's market share presents similar issues. The business press is filled with claims that acquirers seek market share in choosing acquisition targets.[3] However, unless they can exploit that market share better than the current owners, it is not clear why market share would make the target firm more attractive to acquirers, given that they would have to compensate the current owners for whatever benefits that they currently derive from market share

Predictions regarding the roles of the target firm's profitability and efficiency have a clearer rationale. To the extent that lower profitability or greater inefficiency exhibited by the target are indicators of poorer performance that the acquiring firm can improve upon, then lower profitability or greater inefficiency should make a target firm more attractive for acquisition.

Other explanatory variables sometimes encountered in previous studies measure the extent to which the loans or deposits of the target bank are local in nature (sometimes called "core deposits" in the case of deposits). The fact that the pricing of such loans and deposits makes them profitable should not in itself affect acquisition likelihoods if this is valued as much by the current owners as the prospective ones.   If, however, some kind of synergy exists in matching the acquirer's products or services with the target's local

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[3] An article by Klein, appearing in the April 5th issue of The American Banker, for example, notes that one reason that Centra Financial Holdings sought to acquire Smithfield State Bank was that Smithfield had a strong market share in Fayette County, Pennsylvania.

customers, or alternatively, if the acquirer is at a disadvantage or must incur an extra cost to sell or provide services to the local customers of the target, then the composition of the target's clientele could influence its prospects for acquisition. In the case of depositors, the opportunity afforded the acquirer to "cross sell" to newly acquired local depositors is an example of a synergy often referred to in the financial press.[4] An example of a disadvantage encountered by an acquirer would be the tendency of local depositors to withdraw deposits as a result of the change in ownership. In the case of lending, lack of familiarity with the area in which the target firm operates may mean that a prospective acquirer is at a disadvantage in assessing the risks of lending to local borrowers, while any funding advantage that the acquirer may possess would provide it with an advantage in lending to local borrowers.[5] How these various advantages and disadvantages balance out in determining the likelihood of an acquisition is essentially an empirical question.

Virtually all previous examinations of the characteristics that make a bank more or less likely to be acquired include the capital-asset ratio as an explanatory variable, with varying explanations for its inclusion. We can think of four possible explanations that are consistent with our view that differences in the valuations of potential acquirers and targets determine the likelihood of an acquisition. The first two predict a positive relationship between a bank's capital-asset ratio and its prospects for being acquired. One rests on the simple proposition that some banks have assets that are more diversified than other banks, and those that cannot as readily diversify their assets must hold greater levels of capital. If capitalization therefore serves as an index of the inability of a bank to

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[4] A recent article in the American Banker, for example, notes the importance of cross selling opportunities in Wachovia Corp.'s bid for Golden West Financial Corp. and in Capital One Financial Corp.'s bid for North Fork Bancorp, Inc. See Rieker (2006).
[5] See Park and Pennacchi (2005) for a detailed discussion of this issue.

diversify assets, then the assets of more capitalized banks would be worth more to better diversified acquirers than to the current owners, thus enhancing the likelihood that the bank will be acquired.

A second argument for a positive relationship can be made if acquirers face regulatory pressure to increase capitalization above current levels. Since acquisition of a better capitalized target can be one way to increase capitalization, the better capitalized target may be worth more to the undercapitalized acquirer than to the current owners, thus making a merger between the two entities more likely.

There are, however, reasons to expect a negative relationship between a target bank's capitalization and the likelihood that it will be acquired. As we have seen, several studies explain observed negative relationships by noting that capitalization may be an index of managerial ability or efficiency. In this case, better capitalized banks would be less attractive to potential acquirers, since they would, on average, generate smaller gains from the presumed better management or efficiency of the acquiring firm. In essence, this argument assigns the same role to capitalization as the role typically asserted for measures of target profitability or inefficiency. They can all be argued to indicate managerial ability or efficiency, and thus they can all be predicted to reduce the attractiveness of a target to acquirers.[6]

A related argument is that, when a bank's capitalization is so low that the bank is in danger of default, an incentive exists for an acquisition to occur. The relevant question is why being near default would make ownership of a bank more attractive to potential acquirers than to current owners. This would certainly be the case if, as in the 1980s and

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[6] If all three variables are employed to index managerial ability or efficiency, then inclusion of all three variables in a multivariate analysis would make sense only if one believes that they measure different aspects of managerial ability or efficiency.

early 1990s, government entities offered to assume troubled assets to encourage acquisition by healthier acquirers, or if a bank were more likely to fail under existing ownership than under new, better financed ownership that could take advantage of opportunities not available to the existing owners. Since the period that we examine was a period of substantial bank capital strength, with few institutions near default, we do not consider this a particularly plausible explanation for the results reported in the paper.

We offer here another reason for the almost universally observed negative relationship between capital-asset ratios and the likelihood of acquisition—a reason that, to our knowledge, has not been offered in previous studies of acquisition likelihoods. Quite simply, acquirers prefer a high level of leverage because it enables them to maximize the magnitude of post-merger performance gains relative to the cost of achieving those gains. Suppose that the size of the gains that the acquirer expects to achieve (through better efficiency or because of some other sort of synergy) is positively related to the asset size of the acquired firm. Given the asset size of the firm, however, the purchase price of the acquisition is generally lower, the less capitalized is the firm. Thus, a less capitalized target firm, all else equal, offers acquirers the prospect of achieving a given size performance gain for less of an "investment." Hannan and Rhoades (1987) note that conversations with those who arrange bank mergers invariably suggested that high capitalization is viewed as a deterrent to acquisition, because more must be paid for a firm with assets of a given size. Such comments may reflect the view that larger targets provide the opportunity for greater gains in performance.

As discussed below, the issue of whether target bank capitalization is an inducement or a deterrent to acquisition is relevant to predictions concerning the likely impact of Basel II capital standards on bank merger activity.

The length of time that a bank has been operating may also be relevant to its prospects for being a target for acquisition. Many acquisitions of new banks are prohibited for at least the first few years of their existence. However, length of time since formation may capture otherwise unmeasured elements of a bank's successful operation, in which case one might expect a negative relationship between the bank's age and the likelihood of it being acquired.

Consider next the size of the target banking organization. The relationship between a banking institution's size and its prospects for being acquired is a complicated one. If, as seems likely, there are economies of scale reflected in acquisition costs, then an acquirer might find larger bank targets more attractive. However, it is probably also true that the cost of acquisition is more onerous for smaller acquirers than for larger ones, and that it becomes more costly, the larger the mismatch in size. Such interactions between the size of the acquirer and the target firm undoubtedly account for the fact that targets are typically acquired by larger organizations. Such interactions also suggest that the prospect for being acquired may vary by size.

These considerations also suggest that the number of potential acquirers large enough to acquire a given target could be important in explaining the likelihood that a bank is acquired. If proximity between target and acquirer makes an acquisition more

likely, then banks in urban areas may be subject to higher likelihoods of acquisition, since they may face a greater number of potential acquirers large enough to acquire them.[7]

4. The Empirical Model

We use Cox (1972) proportional-hazard duration models with time-varying covariates to estimate the relationship between various covariates and the hazard of acquisition (i.e., the likelihood that a bank is acquired during a given period, given that it has not been acquired by that period). This relationship may be expressed as

$$h_j(t \mid X_j(t)) = h_0(t)\exp(X_j(t)\beta) , \qquad\qquad (1)$$

where h_j is the hazard function of firm j, and h_0 is an unspecified "baseline hazard." The expression $exp(X_j(t)\beta)$ is the systematic part of the hazard function, where $X_j(t)$ denotes the vector of covariates applying to bank j, and β denotes the coefficient vector.

While estimation of (1) will provide information on the risks of acquisition in general, it is also possible, through the use of a "competing risk" proportional hazard model, to investigate the determinants of acquisition by various types of acquirers. Two important dimensions along which acquirers differ are size and location. One can readily imagine that a large acquirer would view the size of a potential target differently than would a small acquirer, and market characteristics like market concentration and (as discussed below) efficiency may play a different role in explaining the likelihood of an acquisition, depending on whether or not the acquirer operates within the market of the target banking organization. To investigate these issues, we exploit the fact that in our

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[7] Also, banks in urban areas may be more likely to be acquired if antitrust authorities are less likely to prohibit potential deals in such areas. However, urban markets may be easier to enter de novo, so banks' preference to enter rural markets by acquisition may make banks in those markets relatively more likely takeover candidates.

data, acquisition by one type of acquirer removes the bank from the risk of another type of acquisition—a phenomenon called "competing risk" in the duration-model literature. Under these circumstances, the competing risk proportional hazard estimations yield separate coefficients for each of the different types of risks (acquisitions in this case) at issue.

Specifically, we report results of competing-risk proportional hazard estimations in which the acquirers are divided into the four different categories formed by the distinction between large and small acquirers and the distinction between acquirers that operate within and outside the geographic market of the target organization.[8] Because this is the first study to investigate the likelihood of bank acquisitions during a period in which restrictions on interstate acquisitions were not in effect, we also use this methodology to investigate whether the risk of acquisition by an out-of-state acquirer differs systematically from the risk of being acquired by a bank located within state.

5. The Sample and Data

As noted, acquisitions in this study are defined as occurring when there is a change in control, which happens when a bank or bank holding company that owns less than 50 percent of another banking organization's equity increases its ownership to more than 50 percent. In the vast majority of cases, this condition is met by ownership changing from a very small share, often 0 percent, to 100 percent or close to it.

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[8] Wheelock and Wilson (200) use this procedure to distinguish between the likelihood of a bank disappearing due to acquisition and the likelihood of it disappearing due to failure. The risk of failure is not addressed in this paper, primarily because so few failures occurred during the period that we investigate.

By using the change-in-control standard, deals involving banking firms with a variety of organizational forms can be included. Our sample includes every possible combination involving independent banks and bank holding companies. Moreover, the sample does not count as acquisitions the mergers of bank subsidiaries that are already controlled by the same holding company.

Data on acquisitions were obtained from SNL Financial and include the large majority of transactions between commercial banking organizations that took place during the relevant time period (1996-2003). Data from the National Information Center, maintained by the Federal Reserve Board, were used to identify the date that each acquisition was completed. The time period analyzed in this study differs from those of many previous studies that address similar issues related to acquisition likelihood, because it covers a period that is quite recent and characterized by substantial consolidation and few bank failures.

The unit of observation for our analysis is a banking organization in a given year. An in-market acquisition is defined as a deal in which at least 50 percent of the target's deposits are in a local market—a metropolitan statistical area (MSA) or nonmetropolitan county—where the acquirer also has deposits. An out-of-market acquisition is defined as one in which less than 50 percent of target deposits are in local markets that contain at least one branch of the acquirer. The size threshold of $1 billion will be used to distinguish between large and small acquirers.

To reduce the potential effect of endogeneity on estimation results, explanatory variables are measured before the period over which acquisition behavior is observed. Specifically, variables reflecting information at a given point in time are measured as of

June 30 before the start of the possible acquisition year. Variables reflecting performance over a period of time are measured over the full year immediately before the possible acquisition year.

Observations need to meet several criteria to be included in the sample. One important criterion is data availability. In some cases, new banks were dropped because they did not have enough prior data. We require that a banking organization have been in operation and have data for at least two years prior to the start of the merger year being analyzed. This requirement reduces the likelihood of any confounding effect attributable to the fact that new banks are sometimes legally restricted from being acquired.

Substantial effort was made to track organizations from year to year. During the analysis period, many independent banks formed new bank holding companies, which were frequently simple one-bank holding companies with the formerly independent bank serving as the only bank subsidiary. These corporate reorganizations pose a challenge, because a naive application of the data associated with such events would suggest that one organization (the independent bank) was closed and a new one (the new BHC) started or that the new BHC acquired the independent bank. We believe that the independent bank and subsequent new BHC should be treated as the same organization, and we make adjustments to do that. We also account for other cases in which an organization name (actually, identification number) would have changed, but the change was not due to an event that triggered a change in control.

The large majority of banks in the sample are analyzed in each year from 1996 to 2003. Obviously, some leave the sample because they were acquired. Others leave the sample for other reasons. Although most banks are observed for the first year of the

study period, 1996, some banks enter the sample after 1996. Observations of these

organizations are included for the years for which they operated. Because there may be

systematic differences across "cohorts" (defined by the year in which the institution is

first observed), dummy variables indicating the cohort to which each banking

organization belongs are included in all estimations reported below.

Detailed definitions of all variables used in the analysis are presented in Table 1,

along with their sample means. In total, the sample consists of nearly 8,000 banking

organizations observed annually, for a total of roughly 43,000 observations. Over 1,400

of these observations are associated with banking institutions that were acquired at some

time during the study period. These 1,500 acquisitions are fairly evenly divided among

four categories of acquisitions, defined according to whether the acquirer is (1) small and

in-market, (2) small and out-of-market, (3) large and in-market, and (4) large and out-of-

market.

6. The Hazard Estimation Results

Table 2 presents the results obtained using the Cox proportional hazard estimation

procedure. All reported estimations include cohort fixed effects, but these are not

presented for reasons of space. A positive (negative) coefficient indicates that an

increase in the corresponding explanatory variable is associated with an increase

(decrease) in the acquisition hazard, defined as the likelihood that the bank is acquired,

given that it has not been acquired up to the observed point in time. The first column

presents results obtained when any of the 1,422 acquisitions in the sample is treated as

equivalent, with no distinction made between the types of acquirer involved in the

acquisition. The next four columns present estimation results obtained when failure is defined as being acquired by a certain type of acquirer (large outside of the market, large within the market, small outside of the market, small within the market). In modeling disappearance (as an independent entity) through acquisition of one type, disappearance because of another type of acquisition is treated as censored at the time of disappearance. Coefficient estimates presented in these four columns may be thought of as the results of a competing-risk, proportional hazard estimation.

Note first that the coefficients of the log of the age of the potential target [denoted *ln(age)*], are negative and highly significant in all estimations. A positive coefficient might reflect the fact that many states prohibit acquisitions of new banks for the first few years, but, as we have noted, a negative coefficient may result if a bank's age captures otherwise unmeasured elements of a bank's successful operation, thus reducing the gain that an acquirer might expect to derive from an acquisition. The negative and highly significant coefficients observed here are consistent with the latter explanation and not the former.[9]

The coefficients of the target bank's lagged return on assets (*roa*) are negative in all five cases and highly significant in four cases. This finding is perhaps the most direct evidence of what may be termed the "efficiency hypothesis," which asserts that mergers serve to transfer assets from owners who are using those assets less efficiently to owners who can more efficiently use those assets, either because they are better managers or because they can combine the assets of the acquired and acquiring firm to achieve some sort of synergy. As noted above, many studies have reported this relationship, but studies

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[9] The exclusion of banks for which few years of data are available limits the role of the former explanation.

by Hannan and Rhoades (1987) and Hadlock, Houston and Ryngaert (1999) are notable

exceptions.

The coefficients of *inefficiency* are positive and significant in the case of the

overall proportional hazard estimation and for the competing-risk proportional hazard

estimations in the cases of the two categories of in-market acquisitions, but they are not

significant in the cases of the two categories of out-of-market acquisitions. This measure,

defined as noninterest expenses divided by the sum of noninterest income and net interest

income, is a commonly used accounting-based measure of bank inefficiency. The

"efficiency hypothesis" implies positive coefficients of this variable, to the extent that the

measure captures aspects of poorer performance on the part of existing managers that are

attributable to efficiency and not captured by the profitability measure.[10]

It may be useful to speculate on why the coefficients of this variable are positive

and significant for in-market acquisitions but not for out-of-market acquisitions. It may

be that potential acquirers in the same market have better knowledge of the nature of the

inefficiency reflected in the measure and can thus better assess whether they can improve

upon it after acquisition. More concretely, they may be in a position to increase

efficiency, because they are in a better position than out-of-market banks to close

facilities and branches and eliminate resources made redundant by the acquisition. This

finding of a positive relationship between inefficiency and the prospects of acquisition

contrasts with the results found for measures of inefficiency used by Wheelock and

Wilson (2000), who report significant negative coefficients for a measure of cost

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[10] Yearly correlations of these two measures of performance are typically less than 0.2. Exclusion of one variable tends to increase the statistical significance of the other, but the coefficients of *inefficiency* do not reach statistically significant levels in the case of out-of-market acquisitions even when *roa* is excluded from the analysis.

inefficiency and statistically insignificant coefficients for two measures of technical inefficiency.

Coefficients of the target bank's capital-asset ratio (k/a) are negative and significant in the case of the overall proportional hazard estimation and negative and significant in three out of four cases in the competing-risk proportional hazard estimations. This negative relationship between the capital-asset ratio and the prospects for being acquired has been reported in nearly all past studies relevant to the likelihood of a bank being acquired, and the question arises as to its cause.

As noted above, we do not think that arguments that connect the capital-asset ratio to the likelihood of failure are relevant for our sample, in part because so few banks were in danger of failing during the period studied. It is possible, as some have argued [see, for example, Wheelock and Wilson (2000)], that the capital-asset ratio reflects past performance and serves as an index of likely future performance. Therefore, a low-capital asset ratio indicates to potential acquirers that greater efficiency and performance gains are likely if the bank is acquired. This explanation rests on the belief that the capital-asset ratio provides information to potential acquirers on the underlying performance of the target bank that the measures of profitability and inefficiency, already accounted for in the analysis, do not. As noted above, our preferred explanation, which is based on leverage, is that the efficiency gains expected to be achieved by the acquirer after the acquisition are greater, the greater is the asset base of the target bank and that the price that must be paid to acquire the firm is less, the less is the capital of the bank. Thus the capital-asset ratio serves as an inverse index of the gains achievable per dollar expenditure for the firm.

This issue of the relationship between a bank's capital-asset ratio and its attractiveness for acquisition has arisen recently in the debate over the proposed Basel II capital standards. Some have expressed concern that, because the proposed implementation in the United States of Basel II may allow lower capital-asset ratios for the largest banking organizations than for the vast majority of smaller organizations, incentives may be created for the larger organizations to acquire smaller, more highly capitalized banks. The results of this analysis, which suggest that greater capitalization deters rather than attracts potential acquirers, cast doubt on the validity of this concern.[11]

Consider next the observed role of market concentration, measured by the Herfindahl-Hirschman Index and calculated using bank deposit shares (*hhi*). A higher level of concentration might make acquisition more likely by acquirers that operate in the same market as the potential target, since market power could be enhanced by the acquisition. However, antitrust policies are designed explicitly to restrict this possibility, so it is not clear *a priori* whether a positive and significant relationship in these cases will be observed. As noted above, it is not obvious why greater market concentration would make acquisition by out-of-market acquirers more likely. At any rate, no statistically significant coefficient of *hhi* is found in any of the estimations reported in table 2.

The relationship between a bank's market share (*mshare*) and the likelihood that it is acquired differs dramatically, depending on the type of acquirer. Although the coefficient of *mshare* is negative and not statistically significant in the overall proportional hazard estimation, its coefficient is positive and highly significant in the competing-risk proportional hazard estimation for large acquirers operating outside the

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[11] See Hannan and Pilloff (2005) for a full discussion.

market of the target bank. This finding seems to support reports in the business press about the importance to some banking organizations of "acquiring market share."

The reason for this relationship is not clear. Perhaps large banks with a "brand name" are better able to exploit the advantages that a large market share may bring to a banking organization than are banks without a "brand name." Note, however, that within the competing-risk proportional hazard estimations, the coefficients of *mshare* are negative and highly significant for acquirers that operate within the same market as the target bank. These negative coefficients may reflect the deterring effects of antitrust enforcement, since acquisitions among banks in the same market that entail larger market shares are more likely to face antitrust sanctions.[12]

The next two variables, *locloans* and *locdeps*, measure the ratio of local loans to assets and local deposits to assets, respectively. These bank characteristics are included in the analysis because they are likely to represent the degree to which a bank relies on local customers, and the potential acquirer may perceive advantages (as result of synergies, for example) or disadvantages in providing deposit or lending services to such customers.

The coefficients of *locloans* are positive in the competing-risk proportional hazard estimations for large acquirers, but they are not statistically significant. In contrast, the coefficients of *locdeps* are positive and highly significant in all five cases. Clearly, acquirers of all types find attractive for acquisition banks that have high ratios of local (sometimes called "core") deposits. This may be due to synergies involving local depositors, such as the ability to "cross sell" local depositors the other products that a

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[12] In the case of smaller acquirers in the same market, this effect may also reflect the fact that smaller banks cannot as readily acquire larger targets. This effect, however, is presumably accounted for by the explicit distinction that we make between acquisitions by large and small banks.

new acquirer may have to offer. Acquiring local deposits may also represent an efficient way for a bank to develop and maintain other beneficial relationships with local customers.

The log of the assets of the bank, denoted *ln(size)*, is another variable for which the type of acquirer matters greatly. While the coefficient of this variable is significantly negative in the overall proportional hazard estimation, in the competing-risk proportional hazard estimations the coefficients of this variable are significantly positive in the case of large acquirers but significantly negative in the case of small acquirers. This result for smaller acquirers obviously reflects the fact that smaller banks rarely acquire larger ones, presumably because the costs of acquisition and integration are more onerous, the greater the mismatch in size. The positive and highly significant coefficients found for large acquirers are of more interest. Larger banks presumably could easily acquire smaller banking organizations, but they seem to find larger organizations more attractive for acquisition. This probably reflects the existence of economies of scale in the acquisition process, making the strategy of a few large acquisitions more attractive than a strategy of acquiring many smaller institutions.

The positive coefficient of *urban* in the overall proportional hazard estimation implies that, all else equal, banks in metropolitan areas are more likely to be acquired than their rural counterparts. In the competing risk proportional hazard estimations, the positive coefficients of this variable for large and small acquirers that operate in the same market probably reflects the fact that urban areas provide more potential acquirers within the market and that combinations of firms within urban markets are less likely to raise antitrust concerns. The positive and significant coefficient observed for large acquirers

that do not operate within the market of the target is perhaps of more interest, since it indicates a preference for urban operations on the part of large banks. The negative and statistically significant coefficient of *urban* found for small banks operating outside the market suggests that such banks may be deterred by the rigors of competition in urban areas.

Note finally that the underlying assumption of proportional hazards is tested using a test statistic discussed and generalized by Grambsch and Therneau (1994). As indicated, the assumption of proportionality can be rejected at a low level of significance (10 percent) for the overall proportional hazard estimation, but it cannot be rejected for any of the competing-risk proportional hazard estimations. This is noteworthy in light of our view that the competing risk estimations, because they disaggregate sometimes very different underlying relationships, present a more realistic picture of the relationship between acquisition hazards and their determinants.

Table 3 reports results designed to address the question of whether the determinants of acquisition by out-of-state acquirers are any different (or play any different role) than the determinants of acquisition by in-state acquirers. The first two columns in table 3 report results obtained when the hazard associated with being acquired by a large bank operating outside the market of the target bank (reported in the second column of results in table 2) is divided into two competing risks: the risk of being acquired by a large in-state bank operating outside the market, and the risk of being

acquired by a large out-of-state acquirer. The last two columns of table 3 report the same breakdown for small acquirers.[13]

In comparing the first two columns of results, one can observe a number of similarities between the determinants of the hazard of acquisition by large in-state (but out-of-market) acquirers and the determinants of the hazard of acquisition by large out-of state acquirers. In both cases, age of the target bank is significantly negatively associated with the hazard of acquisition, and, as we have already seen for larger acquirers, the size of the target bank is significantly positively associated with the hazard of acquisition. In the case of *roa* , *locloans*, and *locdeps*, coefficients are significant for in-state acquirers and not for out-of state acquirers. These differences may be due to less emphasis placed on these characteristics by out-of-state acquirers, but they may also simply reflect the fact that there were more acquisitions by large in-state (but out-of-market) acquirers than there were acquisitions by large out-of-state acquirers (256 vs. 74).

The most striking differences are in the coefficients of *mshare* and *urban*.   While we have seen that large out-of-market acquirers seem to find targets with larger market shares particularly attractive for acquisition, this does not seem to be the case for large out-of-state acquirers. The second striking difference occurs in the coefficients of *urban*. Differences in these coefficients imply that large out-of-state acquirers place far greater emphasis on acquiring targets that operate in urban areas. Both of these differences are statistically significant at the 10 percent level. The general picture presented by these results is that large out-of-state acquirers place primary emphasis on acquiring a large

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[13] The few acquisitions of banks in different states, but in the same market (which can occur in the case of a multistate metropolitan area) are not included in this analysis.

bank in an urban area of the new state, paying less heed to the market share of the target

bank and perhaps to other characteristics as well.

As indicated in table 3, there were only 47 interstate acquisitions involving small

acquirers (i.e., acquirers with assets less than $1 billion). Nonetheless, we do find many

of the same statistically significant effects for acquisitions by these acquirers that we find

for small in-state (but out-of-market) acquirers. For both types of acquisitions, the

coefficients of *ln(age)*, *roa*, and *ln(size)* are negative and statistically significant. As in

the case of large acquirers, one of the most striking difference between small in-state and

out-of-state acquirers is in the relative attraction of urban areas for out-of-state acquirers.

Although the coefficient of *urban* is positive and not statistically significant for small

out-of-state acquirers, it is negative and highly significant for small in-state (but out-of-

market) acquisitions.[14] Thus, while small out-of-market acquirers tend to be more

attracted to targets in rural areas in the case of in-state acquisitions, this appears not to be

true for acquisitions involving small out-of-state acquirers.

7. Conclusions

This study employs a large sample of banking organizations, observed annually,

to investigate the characteristics that influenced the likelihood of a bank being acquired

during the period from 1996 to 2003. Since this is the first study of acquisition

likelihoods to use data recent enough to include a substantial number of interstate

acquisitions, it is the first to investigate whether the determinants of interstate

acquisitions differ meaningfully from the determinants of intrastate acquisitions. Another

major difference from previous large-sample studies of bank acquisitions is that we

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[14] The difference in these coefficients is statistically significant at the 5 percent level.

define an acquisition to occur when there is a change in control rather than when a target banking institution is merged into another banking institution. This means that the many cases in which a bank is acquired and then operated as a separate subsidiary of the acquiring holding company are counted as acquisitions, and the many cases involving the merging of banking subsidiaries owned by the same bank holding company are not counted as acquisitions.

Following Wheelock and Wilson (2000), we us a competing-risk proportional hazard model to estimate the relationships between various bank and market characteristics and the "hazard" of being acquired. In our study, however, the type of acquirer, classified according to location and size, defines the competing risks. This provides a natural framework for investigating the determinants of in-state and out-of-state acquisitions, in-market and out-of-market acquisitions, and acquisitions by small and large banks, since acquisitions by different types of banks can be modeled as competing risks.

Our choice of the bank and market characteristics to include in the analysis and our expectations regarding their influence on acquisition hazards reflect the belief that acquisitions occur when a prospective acquirer values the assets of the target firm more highly than do the existing owners. Results on the whole are consistent with this framework. In particular, less profitable firms are more likely to be acquired, regardless of the type of acquirer, and, in a number of cases, a measure of inefficiency is found to be positively related to the hazard of acquisition. We also confirm, as reported in most previous studies, that banks with higher capital-asset ratios are less likely to be acquired, and we offer a new and, in our opinion, more plausible explanation for this common

finding. We also note that this finding casts doubt on some of the more dire predictions regarding the likely impact of Basel II capital standards on future merger activity.

We also find a robust relationship between the proportion of local deposits (sometimes called "core deposits") that a bank has and the hazard of being acquired. Banks with higher ratios of local deposits to assets are more likely to be acquired, no matter the type of acquirer examined. This may reflect a preference for local customers as a result of some synergy associated with acquisitions of banks with substantial local deposits, such as the ability to cross sell to local depositors.

Modeling the prospects of acquisition in terms of competing risks of acquisition by different types of acquirers reveals some interesting distinctions that would be masked by a more aggregated treatment. First, the measure of inefficiency employed in the analysis is positively associated with the hazard of acquisition by acquirers operating in the same market as the target but not by acquirers outside the market. This may reflect better knowledge of the target's operations by potential acquirers in the same market or their greater ability to introduce efficiencies by closing overlapping facilities and eliminating unnecessary personnel. Second, greater market share is associated with a greater hazard of acquisition by large out-of-market acquirers, but a lower hazard of acquisition by potential acquirers operating in the same market. Among other possible causes, this latter negative effect may reflect the deterrent effect of antitrust enforcement. Third, the impact of bank's size on its prospects for being acquired differs markedly, depending of the size classification of the potential acquirers. Not surprisingly, a bank is less likely to be acquired by small acquirers, the greater its size, but perhaps less obviously, it is more likely to be acquired by large acquirers, the greater its size. This

latter finding suggests the existence of economies of scale in the acquisition process, whereby it is more efficient to acquire a large bank than many smaller ones.

Finally, the data and statistical methodology employed in the paper make possible an explicit examination of the hazard of being acquired by an out-of-state acquirer.   This analysis reveals, among other things, that out-of-state acquirers place more emphasis on being represented in an urban area of the new state, and, in the case of large out-of-state acquirers, seem to pay less heed to other relevant bank and market characteristics than do equivalent in-state acquirers.

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Table 1
Explanatory Variables

Variable name	Description	Mean
k/a	Ratio of a banking organization's book value of capital to total assets (x 100)	10.59
roa	Net income divided by average assets of the banking organization (x 100)	1.19
inefficiency	Non-interest expenses divided by the sum of non-interest income and interest income minus interest expenses (x 100)	65.09
mshare	Weighted average deposit-based market share of a banking organization in all markets where that banking organization has a branch (in percent)	13.00
locloans	Ratio of a banking organization's local loans (defined as all loans not made to other depository institutions, governmental entities, or to non-US addresses) to total assets (x 100)	58.52
locdeps	Ratio of a banking organization's local deposits (defined as all deposits not held by other depository institutions, governmental organizations, or foreign entities) to total assets (x 100)	77.67
hhi	Weighted average deposit-based HHI in all markets that a banking organization has a branch	1993.32
ln(size)	Natural log of a banking organization's total assets	11.30
ln(age)	Natural log of the age of a banking organization or its oldest subsidiary, whichever is larger	3.50
urban	A binary variable equal to 1 if more than 50 percent of a bank's deposits are in an MSA; 0 otherwise	.48
cohort1996, cohort1997 cohort1998, cohort1999, cohort2000, cohort2001, cohort2002	Binary variables indicating the cohort (defined by the year in which the bank is first observed) to which the bank belongs	.918 . .012 .015 .015 .017 .010 .010

Table 2

Cox Proportional Hazard Estimations for the Prospect of Being Acquired during the
period 1996-2003, with Cohort Fixed Effects

	By any acquirer	By a large acquirer outside the market	By a large acquirer inside the market	By a small acquirer outside the market	By a small acquirer inside the market
ln(age)	-.30**	-.37**	-.34**	-.27**	-.33**
	(-9.66)	(-5.46)	(-6.15)	(-3.87)	(-4.82)
roa	-.10**	-.091*	-.057	-.16**	-.11**
	(-6.18)	(-2.33)	(-1.41)	(-5.09)	(-3.61)
inefficiency	.0044**	-.0051	.0042*	.0011	.0053*
	(3.89)	(-1.06)	(2.16)	(.33)	(2.53)
k/a	-.026*	-.045*	.0047	-.042*	-.046*
	(-2.43)	(-1.76)	(.24)	(-2.23)	(-2.19)
hhi	.58E-4	-.63E-4	-.91E-4	.28E-4	-.93E-4
	(1.35)	(-.66)	(-.84)	(.40)	(-.88)
mshare	-.0060	.021**	-.053**	.0062	-.035**
	(-1.60)	(2.66)	(-4.36)	(1.02)	(-2.98)
locloans	-.00037	.0072	.0050	-.0043	-.0071
	(-.18)	(1.57)	(1.34)	(-.32)	(-1.63)
locdeps	.021**	.024**	.039**	.017*	.020*
	(6.12)	(3.26)	(6.08)	(2.23)	(2.56)
ln(size)	.22**	.42**	.57**	-.35**	-.31**
	(9.24)	(9.39)	(14.21)	(-5.31)	(-4.42)
urban	.32**	.34*	.91**	-.45**	.20
	(3.71)	(2.33)	(3.76)	(-3.02)	(1.05)
proportionality test	24.17[+]	4.41	10.19	17.31	11.43
No of acq.	1.422	330	446	356	290
No. of banks	7,799	7,799	7,799	7,799	7,799
No. of obs.	43,043	43,043	43,043	43,043	43,043

Note: Cohort fixed effects are included in all estimations. The symbols +, *, and **
denote significance at the 10, 5, and 1 percent levels, respectively.

Table 3
Proportional Hazard Estimations Comparing Results obtained for In-State (but out-of-market) Acquisitions and Out-of-State Acquisitions

	By large in-state (but out-of-market) acquirers	By large out-of-state acquirers	By small in-state (but out-of-market) acquirers	By small out--of-state acquirers
ln(age)	-.35**	-.50**	-.23**	-.57**
	(-4.32)	(-3.59)	(-2.86)	(-4.82)
roa	-.099*	-.068	-.18**	-.14**
	(-2.43)	(-.31)	(-4.45)	(-2.32)
inefficiency	-.0010	-.019	-.10E-3	.0022
	(-.19)	(-1.52)	(-.03)	(.31)
k/a	-.039	-.062	-.046*	-.040
	(-1.33)	(-1.12)	(-2.18)	(-1.03)
hhi	-.12E-3	.16E-3	.32E-4	.80E-4
	(-1.15)	(.72)	(.42)	(.40)
mshare	.028**	-.013	.0060	-.22E-3
	(3.13)	(-.67)	(.92)	(-.01)
locloans	.0093+	.0017	-.0010	-.0054
	(1.75)	(.19)	(-.23)	(-.51)
locdeps	.026**	.019	.018*	.011
	(2.99)	(1.37)	(2.19)	(.63)
ln(size)	.42**	.46**	-.30**	-.74**
	(8.19)	(4.92)	(-4.20)	(-3.82)
urban	.11	1.15*	-.61**	.43
	(.55)	(2.32)	(-3.71)	(1.07)
proportionality test	5.35	3.70	11.36	12.78
No of acq.	256	74	309	47
No. of banks	7,799	7,799	7,799	7,799
No. of obs.	43,043	43,043	43,043	43,043

Note: Cohort fixed effects are included in all estimations. The symbols +, *, and ** denote significance at the 10, 5, and 1 percent levels, respectively.