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The effect of bank mergers on a bank's market share

Linda Elizabeth Bowyer
Iowa State University

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THE EFFECT OF BANK MERGERS ON A BANK'S MARKET SHARE

Iowa State University

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**The effect of bank mergers on
a bank's market share**

by

Linda Elizabeth Bowyer

**A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY**

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In Charge of Major Work

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**Iowa State University
Ames, Iowa
1981**

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CHAPTER I: INTRODUCTION

A horizontal merger is defined as a merger in which the merging companies sell closely related products in the same geographic market (29, p. 123). Since the merging firms are competitors, a horizontal merger can have an impact on the competitive condition of the market.

In the 1950s, the number of mergers involving commercial banks rose substantially and has been high ever since. This rise in bank mergers has caused some concern as to the competitive impact of these mergers. Many economists and bank regulators see a trend towards increasing concentration in banking markets due to these mergers.

The purpose of this study is to examine the change in a bank's market share post-merger. If two banks merge, the resultant bank will obviously have a greater market share than either of the two individual banks. The focus of this study is not to look at this increase in market share but instead to look at the change in market share of the resultant or merged bank in a seven year time period following the merger. If banks that participate in mergers are more aggressive in their market, one would expect their market share to rise post-merger. However, a number of factors could influence how market share changes over time. In this study, such variables as the type of branching allowed in the resultant bank's state, the bank's size and holding company affiliation, as well as other variables, are tested for their possible impact on bank market share. These factors are tested using simple linear regression techniques.

Chapter II provides an overview of the regulation and regulators of commercial banks, with an emphasis on the area of structural regulation in banking. These structural regulations concern:

- 1) Branching by banks
- 2) Bank holding companies
- 3) Bank mergers.

Since the focus of this study is on bank market share, how the market itself is defined in banking is important to the results. Chapter III reviews some of the literature concerning competition in banking markets and how those markets are defined, both as to product and geographically. Special attention is given to the studies done on the effect of bank mergers on competition and overall market structure.

The data base used and the sample selection process are described in Chapter IV, along with the results of regressions testing the change in market share and the impact of the factors mentioned previously. Three different independent variables are used to describe market share and how it changes: market share in 1980, absolute change in market share from 1972-1973 to 1980 and relative change in market share from 1972-1973 to 1980. The geographic market definition used for the mergers in this study is the county or Standard Metropolitan Statistical Area (SMSA) in which the resultant bank is located; the product market variable is demand deposits of individuals, partnerships and corporations (DIPC).

Chapter V summarizes the results and discusses some of the public policy implications of these results. Avenues of future research are also discussed.

CHAPTER II: THE BANKING INDUSTRY

Throughout the history of the United States, banking has been a regulated industry. The main reason for the existence of this regulation is to try to avoid bank failure. One end result of a competitive framework is that the less efficient firm is driven out of business by its more efficient competitor. Risk of business failure is part of the game. But bank failure carries with it higher social costs than does failure in most other industries.

In comparison to most other firms, banks operate with a small amount of owners' equity, usually about ten percent. In such a highly leveraged firm, the incentive to take risks is high since the loss primarily accrues to the depositors and the gains to the stockholders (18). Therefore, a bank failure, by imposing losses on the depositors, can potentially disrupt the payments mechanism by causing the populace to distrust the financial system.

Since bank failure has severe consequences, the regulation in banking is designed to insure the safety of the individual bank (and therefore the depositors' money). Unlike most regulated industries, such as an electrical utility, which are regulated as to the price they charge, bank regulation is not primarily price oriented. Some restrictions on price do exist, such as Regulation Q which limits the amount of interest banks may pay on time deposits. However, the Depository Institutions Deregulation and Monetary Control Act of 1980 calls for a gradual lifting of this ceiling on interest rates over the next six years. There also exists

at the state level some restrictions on the interest rate that is charged on loans, known as usury. But with the move towards deregulation of financial institutions, many states are loosening these restrictions.

Bank regulation tries to promote bank safety through periodic bank examinations, which check on the bank's compliance with the various regulations relating to the riskiness of the bank's loan portfolio and other investments. Banks are also subject to antitrust laws which will be discussed later.

The Regulators

There are primarily four bank regulators: at the federal level, the Comptroller of the Currency, the Federal Reserve System, and the Federal Deposit Insurance Corporation and at the state level, the various state banking commissions. The reason for the existence of four different regulators lies in the institutional structure of banking.

The United States banking system is classified as a dual banking system, which refers to two possible sources of a bank's charter. By law, in order to operate, a bank is required to have a charter from either the Comptroller of the Currency or the relevant state banking authority. If the charter comes from the Comptroller of the Currency, the bank is a national bank; if the charter comes from the state, it is a state bank. The bank's regulator, however, is not solely determined by who granted the charter.

One of the other agencies which could perhaps have jurisdiction over the bank is the Federal Reserve System. Formed in 1913, the

principal task of the Federal Reserve System is to provide a stable monetary system by controlling the money supply and the flow of bank credit. National banks must belong to the Federal Reserve System but membership is optional for state banks. As of 1979, 5,483 banks belonged to the Federal Reserve System out of 14,546 total banks in the United States. National banks accounted for 4,495 of the Federal Reserve member banks, with the other 998 being state banks.

Another agency which has regulatory powers over almost all commercial banks in the United States is the Federal Deposit Insurance Corporation (FDIC), which currently insures each depositor up to \$100,000 on all demand and time deposit accounts. Insurance is voluntary for some state chartered non-member of the Federal Reserve banks; however, approximately 98 percent of all banks carry the FDIC's insurance. Therefore, the FDIC is the only federal agency which has supervisory power over nearly every bank in the United States.

Given these four regulators, there exists some overlap in jurisdiction. To help eliminate multiple examinations of an individual bank, one agency is designated as the "main" regulator. This agency's report on the soundness of the bank is provided to the other agencies with jurisdiction, thereby removing some of the overlap. Multiple examinations still exist for state non-member insured banks. Table 1 details this regulatory structure.

However, other aspects of bank regulation, outside of the examination process, experience overlapping jurisdiction. This study shall be concerned with the regulations concerning banking market structure--

Table 1. Types of banks and the different regulators

Type of bank	C ^a	Regulated by		State ^d	Main regulator(s)
		F ^b	FDIC ^c		
National	X	X	X	X	C
State member		X	X	X	F
State non-member insured			X	X	FDIC, state
State non-member non-insured				X	state

^aComptroller of the Currency.

^bFederal Reserve System.

^cFederal Deposit Insurance Corporation.

^dState banking commission.

specifically, branch banking, bank holding companies and bank mergers.

Branch Banking

Unlike most other countries, the United States has a large number of banks, most of which have only one office. The reason for this probably lies in the fear that having a small number of banks may well lead to a banking monopoly. Branching (operating more than one office) is permitted in most states but the laws vary greatly from state to state.

States can be classified into three basic groups:

- 1) Statewide branching states
- 2) Limited branching states
- 3) Unit banking states.

Approximately forty percent of the states permit branching on a statewide basis and thirty-five percent permit branching on a more limited basis. The term "limited branching" encompasses wide variations among the state laws, ranging from branching only where the head office of another bank does not exist to branching solely within contiguous counties (18). The term "unit banking" refers to states which prohibit branching or severely restrict it (i.e., branches only permitted within a certain distance from the head office). Table 2 contains a list of classification of states as to the status of branch banking. Under the McFadden Act, national banks are subject to the branching laws of the state in which they operate, just as state banks are. The McFadden Act also restricts banks from branching across state lines (22).

Table 2. Classification of states as to the status of branch banking (7)

Statewide branching	Limited branching	Unit banking
Alaska	Alabama	Colorado
Arizona	Arkansas	Illinois
California	Florida	Kansas
Connecticut	Georgia	Minnesota
Delaware	Indiana	Missouri
District of Columbia	Iowa	Montana
Hawaii	Kentucky	Nebraska
Idaho	Louisiana	North Dakota
Maine	Massachusetts	Oklahoma
Maryland	Michigan	Texas
Nevada	Mississippi	West Virginia
New Jersey	New Hampshire	Wyoming
New York	New Mexico	
North Carolina	Ohio	
Oregon	Pennsylvania	
Rhode Island	Tennessee	
South Carolina	Virginia	
South Dakota	Wisconsin	
Utah		
Vermont		
Washington		

Branch banking has been in the past and still is today one of the most controversial issues in banking economics. The questions raised involve economic efficiency, bank safety and service to customers, as well as the effect of branching on competition. Many studies have analyzed both the advantages and disadvantages of branch banking, but the net effect is still a subject of debate (15; 17; 28).

An issue related to branch banking is that of Electronic Funds Transfer Systems (EFTS), which is the application of computer technology to banking services. These systems include such devices as automated teller machines, point of sale systems, and automated clearinghouses. The technology presently exists to operate most of these systems; however, certain economic and legal problems exist. From a legal standpoint, does an automated teller in a grocery store constitute a "branch" of the bank? Many small banks attempt to block, through the branch banking laws, the use of EFTS by larger banks. The reason for this opposition by small banks involves some of the economic issues related to the use of EFTS. EFTS is a high fixed cost service. However, once the system is in existence, the marginal costs are fairly low. The necessary requirement is a sufficient volume to justify the high initial cost of the system. This presents a problem for many smaller banks who may not be able to generate the volume necessary to achieve the lower unit costs. However, technological advances may eventually make EFTS economically feasible for smaller banks (9; 23).

Bank Holding Companies

The growth of bank holding companies (BHCs) during the 1970s in the United States has added another controversial topic to discussions on bank structure. A holding company is a firm which has a controlling interest in one or more banks. As with branch banking, legislation concerning bank holding companies varies from state to state. Holding company activity is permitted in thirty-seven states, while thirteen states prohibit or restrict holding company activity in some way (18). These regulations include the power to decide what banks the holding company may acquire as well as the type of non-bank businesses in which they may engage.

The reason for these regulations is to insure competition as well as bank soundness. For example, the Federal Reserve may wish to restrict businesses acquired by the holding company to those which the management has experience in running or that will not adversely effect the profitability of the banks in the holding company (4).

The economic questions concerning bank holding companies are similar to those on branch banking, such as the competitive effects, operating efficiency, the effect on bank soundness and the overall effect on the concentration of financial resources (19; 21). Most studies concerning bank holding company activity and competition in banking markets have shown the BHC's effect is basically pro-competitive. Holding companies tend to enter market either by foothold or de novo entry. And even when the market is entered by merger, the bank's market

share seems to show no tendency to increase post-acquisition by a BHC (13; 16). However, looking at the broader issues of concentration of resources by holding companies, the evidence suggests an anticompetitive effect (31).

Bank Mergers

The Bank Merger Act of 1960 was enacted in order to require merging banks to obtain permission from a federal regulatory agency prior to consummation of a merger. In the decade prior to this legislation, there had been a large number of mergers, with federal agencies having only limited control through regulations on branching. The Bank Merger Act gave specific agencies the authority to approve mergers under their jurisdiction, as well as established guidelines for use by the agencies in their consideration of a proposed bank merger.

The jurisdiction is as follows:

- 1) The approval of the Comptroller of the Currency is required if the bank resulting from the merger is to be a national bank or a bank in the District of Columbia.
- 2) The approval of the Board of Governors of the Federal Reserve System is required if the resulting bank is to be a member of the Federal Reserve System, operating under a state charter (except if it is in the District of Columbia).
- 3) The approval of the Federal Deposit Insurance Corporation is required if the resulting bank is to be a state chartered bank which is not a member of the Federal Reserve System (except if it is in the District of Columbia).

The two non-deciding agencies as well as the Attorney General serve in an advisory capacity unless, due to probable bank failure, the merger takes place under the emergency provisions of the Act. The Bank Merger Act of 1960 instructed the deciding agency to look at the following three groups of factors before deciding whether to approve the merger.

- 1) Banking factors--the financial history and condition of each of the banks involved, the adequacy of the capital structure, future earnings prospects and management quality.
- 2) Convenience and needs of the communities served by the banks--probable social benefits from the merger.
- 3) The effect of the merger on competition.

After considering all these factors, the agency may approve the merger if it is found to be in the public interest (5).

Two problems existed with the 1960 Act. First of all, the law said nothing about antitrust immunity for bank mergers, which was a great disappointment to groups such as the American Bankers Association (25). The issue of the applicability of antitrust laws to bank mergers was argued in the courts in two landmark cases.

In the United States vs. Philadelphia National Bank, the Supreme Court declared bank mergers to be subject to provisions of the Clayton Act (34). In this 1963 case, the Court held that the proposed merger of Philadelphia National Bank and Girard Trust, which would have resulted in a single bank controlling 36 percent of bank deposits in the four county area of metropolitan Philadelphia, was sufficiently anticompetitive

to be in violation of Section 7 of the Clayton Act. In the 1964 Lexington Bank case, the Supreme Court ruled that bank mergers were also subject to provisions of the Sherman Act (33).

The second problem occurred due to a lack of relative weightings of the three factors to be considered by the deciding agency. The courts have placed far greater weight on the competitive factors, while the regulatory agencies have assigned greater weight to the consideration of banking factors and convenience and needs issues. For example, in the Philadelphia National Bank case, the courts declared that a merger violating antitrust laws could not be upheld on the basis of convenience and needs considerations (12).

To rectify these problems, the Bank Merger Act was amended in 1966. The amended act assigned greater importance to the competitive factors than the original Act. The deciding agency was not to approve any merger that resulted in a monopoly or an attempt to achieve a monopoly in banking in any section of the country. However, an anticompetitive merger, though not of monopolistic proportions, could be approved if the convenience and needs of the community outweighed the anticompetitive aspects of the merger. For example, if the merger of two small banks was judged to be anticompetitive, but by merging, the now larger bank could offer the community new services, the merger may be approved. The amended Act did not provide antitrust immunity but it did set a time limit of 30 days, after agency approval, in which the Department of Justice must file any action against the merger (6). Since 1966, various cases have tested and clarified the new provisions in the amendment (32; 35).

There has been much literature devoted to both banking and convenience and needs criteria in relation to bank mergers. However, since it is the competitive effects that are weighed most heavily, Chapter III will review the studies that have concerned competition in banking.

CHAPTER III: COMPETITION IN BANKING:
A REVIEW OF THE LITERATURE

Banking Markets

Before one can discuss competition in banking markets and how it is measured, one needs to look at what exactly is a banking market. A market can be described in two ways; either geographically or by product. Both descriptions present problems in defining banking markets.

Banks can be considered multiproduct firms, that is, firms that produce many different products. The products in banking are actually services, such as checking and savings accounts, consumer and business loans and trust services. A bank may compete with different financial institutions in these different product markets. How one defines the product market has tremendous importance in determining the importance of structural changes in banking (39).

In the past, the definition of the product market by the courts has been fairly narrow. In the 1963 Philadelphia National Bank case, the Supreme Court found banking itself to be a unique line of Commerce, where the term "banking" refers to the entire range of banking services (34). This product market definition was based primarily on the fact that banks, at the time, were the only financial institutions permitted by law to accept demand deposits. The Court also felt there existed a high degree of interdependency between all the bank's services. This position was reaffirmed in the Phillipsburg National Bank case in 1970. The Court emphasized customers' desires to satisfy all their financial needs

at one institution, making nonbank financial institutions less attractive than commercial banks since these institutions could not have checking accounts (35).

Economic theory has in the past been able to justify both the view of banking itself as a product as well as the bank as a multiproduct firm. The interdependency mentioned by the courts between different bank services was confirmed in a study done by Murphy (24) of thirty Massachusetts municipalities that borrowed in anticipation of tax revenue. This study showed that interest rates charged by banks were lowest where the banks, which purchased the tax anticipation notes, handled all of a town's business instead of merely holding the proceeds of a note issue as they were being spent. In other words, there existed a relationship between one product sold by the bank (the note purchase) and another product (the town's deposit business).

In order to view a bank as a multiple product firm involved in many different markets, economists make the distinction between the business and non-business customers of the bank. A main proponent of this broad market view is David Alhadeff. He sees banks as financial department stores with only limited tie-ins between products. Alhadeff believes banks compete strongly with other financial institutions in the credit product market. Except for small business loans, banks have been competing with finance companies, credit unions, and savings and loans, among others, in the consumer and mortgage loan markets. Even in the demand deposit markets, many thrift institutions do offer alternatives

to holding demand deposits at commercial banks, especially those deposits which are held as liquid reserves as opposed to those held for transactions purposes (2; 3).

Viewing banks as multiple product firms has gained more acceptability in recent years due to the growing similarity between financial institutions, especially since the Depository Institutions Deregulation and Monetary Control Act of 1980. The demand deposit, which used to be the unique product of a commercial bank, is now available at many thrift institutions. Thrifts are also able to have a higher percentage of commercial and consumer loans in their portfolios (8). This expansion of services offered by non-bank financial institutions takes away much of the uniqueness of "banking" as a line of commerce and may well cause the courts to change the product market definitions in future bank merger and holding company cases.

Alcaly and Nelson in a recent article examined the effect the inclusion of thrift institutions in the product market would have on hypothesized mergers between the second and third largest banks in banking markets in New York and New Jersey (1). They found that, given the Department of Justice's guidelines for challenging horizontal mergers, the Antitrust division would still challenge mergers between large commercial banks in all but ten percent of the local banking markets in New York and New Jersey, even with the inclusion of the thrift institutions. As the data used for this study were from June 30, 1978, it does not take into account the recent increased entry of thrifts into previously bank-dominated services, such as checking accounts.

After one has decided on the product market, the next step is to determine the geographic boundaries of the market. One could look at the location of customers who are important to competing banks. This "demand" market can be delineated by looking at the primary service area of a particular bank, which is defined as that geographic area from which the banking office draws eighty percent or more of its deposits (30). Where the service areas of two banks overlap could be considered a banking market. However, this definition does not take into account potential customers, who do not deal with either firm at present but could switch, given changes in price.

Mathis (20) makes the distinction between this demand side approach, calling it a trade area delineation, and the definition of a market area. The market area should include all firms reacting to the same set of competitive forces on either the supply or demand side of the market. Prices of all firms within the same market setting should be equal, given a homogeneous product. It is this price equalization characteristic which is used by Mathis to delineate banking markets. Others have looked at a particular service offered by a bank, such as business loans, and by use of a customer survey, delineate the location and characteristics of these users. The extensive literature on the topic is reviewed in David Whitehead's article (36).

How banking markets should be defined does differ from how they are defined for regulatory purposes. Schweitzer (30) discusses the Federal Reserve's policy towards market determination in banking. The Fed

distinguishes between a simple and a complex market. Simple markets are where all sellers are viewed as good alternative sources of supply by all customers. For these markets, some sort of price equalization study is done to determine the periphery of the market. For complex markets, where the market is so large geographically that customers do not view every seller as an alternative source of supply, political or demographic boundaries may be used. Counties and standard metropolitan statistical areas (SMSA) are the most commonly used boundaries though usually metro areas, which are areas based on census tract and commuting patterns, are also used. Where there exists any significant doubts as to the accuracy of the market area determination, surveys are used to supplement the data already obtained. From a product standpoint, the Fed, in the past, has basically focused on deposit services and commercial loans.

Measuring Competition

Most measures of competition are in essence measures of market structure. This presumes that there exists a definite relationship between market structure and competitive performance. Whether or not this relationship exists in banking will be discussed later.

Economic theory suggests that a relationship exists between the number of firms in an industry and how competitive the industry is. But just looking at the number of firms does not say anything about the degree of inequality among firms. For this reason, one of the most common measures of market structure is the concentration ratio, C, defined as

the percentage of the market contributed by the largest few firms. The reason for its widespread use is the ease of calculation and data availability.

Another measure is the Herfindahl index, H. This is calculated by squaring and then summing the market shares of all firms in the industry.

$$H = \sum_{i=1}^N S_i^2 \quad \text{where } S_i \text{ is the market share of the } i\text{th firm}$$

When the industry is a perfect monopoly (one firm), H equals one, its maximum value. One main advantage to its use is "the value declines with increases in the number of firms and increases with rising inequality among any given number of firms (29, p. 58)." Usually a great deal of data on individual market share is required to calculate H and for many unregulated industries, it is not available. However, in banking, it is used frequently as market data is public information.

How one defines the variable to be used in calculating either C or H is of some significance. In studies on banking market structure, the most commonly used variable is demand deposits. This is especially true for studies done on the size of local banking markets and competition between banks in those markets (10). Other variables can and have been used such as savings deposits or loans, but other financial institutions would probably have to be included in the industry. As stated before, with the deregulation of banking, it may well be that using demand deposits as a variable may soon pose the same problem as do the other variables.

Structure and Performance

The relationship between banking market structure and performance (as measured by certain market determined variables such as business loan rates, checking account service charges, etc.) has been studied extensively. Edwards (11) found a small, though statistically significant, positive relationship between concentration and business loan rates. "There exists in banking markets some relationship between market structure and market performance, high concentration being associated with less competitive price behavior" (11, p. 300). Rose and Fraser found a significant change in the nature of banking services offered by established banks upon new bank entry into the market-- greater loan/asset ratios, increased competition for time deposits, all seemingly without any adverse effect on bank profitability and growth (14). These studies and others indicate the relevance for looking at structural changes in banking markets; in this research, the structural change was bank mergers.

Impact of Bank Mergers on Structure

Most studies done on mergers and their effect on the structure of the banking industry have tended to focus on aggregate effects, as opposed to looking at individual banking markets. This is due partially to problems in defining the relevant banking market as well as the ease of calculation of the broader measures of market structure.

In a 1974 study, Rhoades and Yeats looked at whether or not a consolidation movement is underway in the banking industry and if the

pattern of mergers is conducive to this movement (27). They constructed a dynamic measure of concentration which indicated that there had been a tendency towards deconsolidation in commercial banking for the years 1960-1971. However, by looking at the growth rate of deposits among different size classes of banks and relating this to merger activity within each class, Rhoades and Yeats found that mergers played a role in a movement toward consolidation in the banking industry. This is especially true of large banks (greater than \$100 million in deposits), most likely due to the fact that these larger banks acquired more and larger banks than smaller size banks. However, this tendency toward consolidation was more than offset by the vigorous internal growth of medium-size banks, leading to deconsolidation overall.

Yeats also did a study, published in 1973, which looked at the influence alternative merger policies might have had on the size distribution of banks (38). Looking at state five-firm concentration ratios as a measure of market structure, Yeats attempted to simulate what structural patterns would have existed in the absence of mergers in three high-merger activity states. In each state, he was able to show that mergers played a significant role in shaping the existing market structure. If no mergers had been permitted, a significant amount of deconcentration would have resulted.

In another study looking at state concentration ratios and bank mergers, done in 1979, Rhoades looked at some of the determinants of changes in three- and five-firm state concentration ratios from 1961 to

1971 (26). The independent variables tested included number of mergers, acquired deposits, dummy variables for whether state law permitted branching and/or multibank holding companies, and growth in state deposits. Merger activity had a positive and significant effect on the change in state concentration. The dummy variables relating to branching and bank holding companies also were positive and significant. Growth was expected to have a negative effect on concentration, as Rhoades hypothesized increased entry and therefore decrease concentration in high growth states. However, growth appeared to have a positive effect on concentration. "The financial strength of the larger banking organizations, perhaps combined with their experience with expansion, permits them to respond comparatively rapidly to growth opportunities" (26, p. 388).

If Bank A merges with Bank B to become Bank AB, how does bank ABs share of the market change over time? The purpose of this research is to answer this question as well as what factors influence these changes. Chapter IV details this research.

CHAPTER IV: THE MODEL AND RESULTS

The object of this study is to examine the changes in a bank's market share post-merger and identify the factors affecting these changes. The factors to be tested include:

1) Growth in total market deposits.

High growth in market deposits would probably attract more entrants into the market, causing market share to decline. However, as in Rhodes' study (26), growth could have a positive affect on a bank's market share, if large market share banks respond better to growth opportunities than small ones.

2) Bank holding company acquisitions.

Bank holding company acquisition of a bank has been shown in previous studies to have a negative effect on bank market share.

3) State branching laws.

Market share should be positively effected by more lenient branching laws, as this would make it easier for the bank to open more offices and thereby increase their market share.

4) Size of bank.

If economies of scale exist in banking, larger banks should experience a positive growth in market share due to the efficiencies of larger size.

5) Offices outside of the primary, head office market.

If linkages between different geographic markets exist, then a bank with a wider network of offices should have greater market power in its primary market.

The Data

Merger reports are published in the annual reports of the three deciding agencies; the Comptroller of the Currency, Board of Governors

of the Federal Reserve System, and the Federal Deposit Insurance Corporation. The reports summarize the information used by the agency to decide whether or not to approve proposed mergers and include the product and geographic market definitions used for considering each merger. As stated in the previous chapter, the most common product market definition used is demand deposits of individuals, partnerships and corporations (DIPC). Political boundaries are used primarily to define the geographic market.

From the merger reports of 1973 and 1974, 51 mergers were chosen to be included in this study. The criteria for selection are as follows:

- 1) All offices of both the acquired and acquiring bank must be in the same county or Standard Metropolitan Statistical Area (SMSA).
- 2) Neither bank must be part of a multibank holding company.
- 3) The merger must not be done for purposes of corporate reorganization or done under the emergency provisions of the Bank Merger Act.

Criterion number one restricts the sample to banks competing at the time of the merger only within the same market area. Criterion number two is necessary in order to look at the possible effect of holding company acquisition on post-merger market share. Since the study is concerned with the competitive effect of mergers, mergers involving problem banks or undertaken for corporate reorganization were excluded. These criteria selected out most very large banks that participated in mergers during

the time period of this study; the implications of this will be discussed in Chapter V.

Each bank in the United States is assigned a unique number, called a certificate number, by the FDIC. If the merged bank retained the same certificate number in 1980 as it had immediately after the merger, the bank remained in the sample. Out of the original sample of 51, only 42 mergers could be used. This is due to some of the merged banks "disappearing", either through merger with another bank or closure.

Of interest in this study, is what happened to the market shares of these merged banks from the time period 1973-1974 to 1980. Since structural changes in local banking markets is of primary interest, the geographic market was defined as the county or SMSA in which the banks are located. Though, as stated previously, the use of political boundaries is not an economically perfect method of delineating markets, it is a simple, reasonably good approximation for a local banking market. In order to be more precise, it would be necessary to examine each merger on an individual basis, which is beyond the scope of this study. From a public policy standpoint, the deciding agencies also use political boundaries. So if one wishes to see what happened to banks involved in agency-approved mergers, it would be useful to use similar market definitions. The product variable used is DIPC since demand deposits tend to be local in nature.

The deposit data necessary for this study was obtained from the Summary of Deposit tapes, purchased from the Federal Deposit Insurance

Corporation by the Economics Department, Iowa State University. This data base contains demand, time, and savings deposit data for every insured commercial bank in the United States for June 30 of each year. Deposits are allocated to specific branches of the bank, if branches exist, not assigned totally to the banking organization, which makes it very useful for any study looking at local markets. Branches are named and numbered, as well as county or SMSA location defined. Other structural information is also contained on the tape, such as whether or not the bank is part of a bank holding company.

The Regression Model

Since the object of this study was to examine the changes in a bank's market share post-merger and what factors affect these changes, a series of simple linear regressions were run to test the significant of the factors mentioned in the beginning of this chapter.

The variables, both independent and dependent, are described in Tables 3 and 4. MSM, market share in 1972-1973, is calculated one year prior to the merger due to a problem present in the Summary of Deposit tapes. As mentioned in the previous section, the deposit data on these tapes is collected for June 30 of a given year. The merger reports, however, are published for December 31. This six month difference requires certain time adjustments in order to calculate combined market share of the two banks participating in the merger. For example, if a merger occurred in February 1973, it would be recorded as a merger in the 1973 report of the deciding agency. However, if one looked at the

Table 3. Independent variable definitions

Name	Definitions
MSM	Market share one year prior to the merger
G	Growth in county or SMSA deposits
BHC	Dummy variable; = 1 if merged bank is acquired by multibank holding company, = 0 if not
UB	Dummy variable; = 1 if merger takes place in a unit banking state, = 0 if not
LB	Dummy variable; = 1 if merger takes place in a limited branching state, = 0 if not
SZ1	Dummy variable; = 1 if merged bank's deposits are between \$0-25M, = 0 if not
SZ2	Dummy variable; = 1 if merged bank's deposits are between \$26-50M, = 0 if not
SZ3	Dummy variable; = 1 if merged bank's deposits are between \$51-75M, = 0 if not
SZ4	Dummy variable; = 1 if merged bank's deposits are between \$76-100M, = 0 if not
MSO	Dummy variable; = 1 if merged bank has offices outside the county or SMSA in 1980, = 0 if not

Table 4. Dependent variable definitions

Name	Definitions
MS80	Market share of merged bank in 1980
CMS	Change in market share from 1972 or 1973 to 1980
RMS	Relative change in market share

Summary of Deposit tape for 1973, the bank would already show up as the merged unit, since the merger occurred prior to June 30. To alleviate this problem, MSM is calculated for one year prior to the year the merger was reported in the annual report. States are classified as to unit banking or limited branching according to Table 2. The dummy variable for statewide branching states is eliminated in order to avoid having a singular matrix. All sample banks, as of 1980, had less than \$100M in DIPC. Therefore, all banks in my sample fall into one of the four dummy variables SZ1 to SZ4. Again, to avoid the problem of a singular matrix, only three of the size dummies are run at any one time. Criteria number one, mentioned in the previous section, allows inclusion of MSO as a variable, since both banks at the time of merger, in order to be in the sample, could have no offices outside the county or SMSA, but may have acquired or opened branches between 1973-1974 and 1980.

Formulas for all variables requiring calculation are listed in Table 5. The Appendix presents the actual data used in the study.

Results with MS80 as the dependent variable

A series of simple linear regressions were run to determine what factors influenced the market share in 1980. These results are listed in Table 6. Regression number one looked at the relationship between the merged bank market share in 1980 and the merged bank market share in 1972-1973, immediately prior to the merger. The relevant question is: Is the coefficient on MSM greater than, equal to or less than one? If

Table 5. Formulas for variable calculation

Name	Formula
MSM	$\frac{\text{DIPC of acquiring bank 1972-1973} + \text{DIPC of acquired bank 1972-1973}}{\text{DIPC of county or SMSA 1972-1973}}$
G	$\frac{\text{DIPC of county or SMSA in 1980} - \text{DIPC of county or SMSA in 1972-1973}}{\text{DIPC of county or SMSA 1972-1973}}$
MS80	$\frac{\text{DIPC of merged bank's offices in county or SMSA as of 1980}}{\text{DIPC of county or SMSA 1980}}$
CMS	MS80 - MSM
RMS	$\frac{\text{CMS}}{\text{MSM}}$

Table 6. Regressions with MS80 as the dependent variable

Regression number	MSM	G	BHC	MSO	UB	LB	SZ1	SZ2	SZ3	Intercept	R ²
1	0.967* (0.021) ^a									-0.001 (0.007)	0.981
2	0.963* (0.023)	-0.010 (0.018)								0.004 (0.011)	0.981
3	0.965* (0.023)	-0.011 (0.019)	0.005 (0.013)							0.003 (0.012)	0.981
4	0.970 (0.024)	-0.014 (0.019)	0.000 (0.013)		-0.003 (0.028)	-0.019 (0.016)				0.020 (0.019)	0.982
5	0.971* (0.021)						0.018 (0.017)	-0.008 (0.021)	0.021 (0.021)	-0.016 (0.017)	0.983
6	0.971* (0.022)			0.013 (0.013)						-0.004 (0.008)	0.981
7	0.967* (0.023)	-0.010 (0.018)		0.013 (0.013)						0.001 (0.012)	0.982
8	0.973 (0.024)	-0.015 (0.019)	0.002 (0.013)	0.010 (0.015)	0.004 (0.030)	-0.014 (0.018)				0.013 (0.021)	0.982
9	0.974 (0.023)	-0.002 (0.019)		0.012 (0.015)			0.020 (0.018)	-0.005 (0.022)	0.017 (0.022)	-0.019 (0.021)	0.983
10	0.975 (0.022)			0.012 (0.015)			0.020 (0.017)	-0.005 (0.021)	0.018 (0.022)	-0.020 (0.018)	0.983
11		-0.176 (0.135)	-0.138 (0.098)		-0.022 (0.197)	0.063 (0.114)	-0.152 (0.130)	-0.113 (0.158)	-0.184 (0.165)	0.416** (0.178)	0.191
12		-0.169 (0.136)	-0.140 (0.099)	-0.085 (0.116)	-0.070 (0.209)	0.024 (0.127)	-0.157 (0.131)	-0.134 (0.161)	-0.154 (0.171)	0.465** (0.192)	0.204

^aNumbers in parentheses denote standard errors.

*Significantly less than one at the 10% level.

**Significantly different from zero at the 5% level.

it is greater than one, the banks in the sample gained market share post-merger. If one assumes that banks participating in mergers are more aggressive businesses, this aggressiveness may continue in the years after the merger, bringing about an increase in market share. If the coefficient equals one, the banks did not gain market share over time--they merely held their original position. If the coefficient is less than one, the banks lost market share from 1972-1973 to 1980. This latter result appear to be the case in runs one through seven, where the coefficient on MSM is significantly less than one at the 10 percent level.

One possible explanation for this finding is that the merger originally took place as a defensive move, by banks who feared an eroding of their present position at the time of the merger. Since the merged banks in the sample are relatively small and with the continued expansion of large banks by branching in many states, it does perhaps make sense that these smaller banks may well lose market share over time.

Regressions 2-10 add on the various possible explanatory variables which could conceivably influence market share in 1980. However, MSM has such a great influence on MS80, as signified by the high R^2 in run one, that these other variables do not appear to have any significant explanatory power. When MSM is left out of the regressions as in runs 11 and 12, the R^2 drops to 0.191 and 0.204 respectively. Even with MSM gone from the regressions, none of the coefficients on the independent variables turn out to be significantly different from zero at the 10 percent level.

It is possible that some of the banks in the sample may have participated in subsequent mergers with banks operating in the same market area (county or SMSA). This acquired market share would tend to raise the coefficient on MSM toward one. To eliminate this bias, it would be necessary to subtract the acquired market share, as of 1980, from MS80. Merger reports of the three deciding agencies were examined from 1973-1974 to 1980. Only one of the merged banks in the sample, merged bank L7, participated in an additional merger within its county. The market share of those additional branches as of 1980 were subtracted out and the regressions re-run. The results are listed in Table 7. As was expected, the presence of one additional merger did not appear to dramatically alter the results from those of Table 6. For all regressions except number 16, the coefficient on MSM is significantly less than one at the 10 percent level, with the coefficients on the other variables not significantly different from zero. The R^2 s are, as in Table 6, very high when MSM is included as one of the independent variables but fall dramatically when MSM is removed as in regression 20.

Results with CMS as dependent variable

Since MSM has such strong explanatory power over the other independent variables in regressions run with MS80 as the dependent variable, a different approach was taken. A series of regressions was run to see if the independent variables used in the previous set of regressions had an influence on the absolute change in market share (CMS). The results of these regressions are listed in Table 8.

Table 7. Regressions with MS80 less acquired market share as dependent variable

Regression number	MSM	G	BHC	MSO	UB	LB	SZ1	SZ2	SZ3	Intercept	R ²
13	0.969* (0.021) ^a									-0.002 (0.007)	0.981
14	0.965* (0.022)	-0.009 (0.018)								0.002 (0.011)	0.982
15	0.966* (0.023)	-0.010 (0.018)	0.012 (0.012)							0.002 (0.002)	0.982
16	0.970 (0.024)	-0.013 (0.019)	-0.002 (0.013)		0.003 (0.027)	-0.013 (0.016)				0.014 (0.019)	0.982
17	0.973* (0.021)						0.017 (0.016)	-0.008 (0.020)	0.022 (0.021)	-0.016 (0.016)	0.983
18	0.971* (0.022)			0.009 (0.013)						-0.004 (0.008)	0.982
19	0.979* (0.025)	-0.005 (0.020)	0.004 (0.015)	0.000 (0.017)	-0.006 (0.030)	-0.016 (0.018)	0.021 (0.019)	-0.005 (0.023)	0.025 (0.025)	-0.007 (0.030)	0.984
20		-0.168 (0.136)	-0.143 (0.099)	-0.089 (0.116)	-0.065 (0.209)	0.028 (0.127)	-0.161 (0.131)	-0.136 (0.161)	-0.155 (0.170)	0.464** (0.191)	0.211

^aNumbers in parentheses denote standard errors.

*Significantly less than one at the 10% level.

**Significantly different from zero at the 5% level.

Table 8. Regressions with CMS as the dependent variable

Regression number	G	BHC	UB	LB	MSO
21	-0.006 (0.017) ^a	0.009 (0.012)			
22	-0.008 (0.017)	0.009 (0.012)			0.017 (0.013)
23	-0.005 (0.019)	0.012 (0.014)	0.008 (0.036)	-0.003 (0.028)	0.022 (0.015)
24	-0.005 (0.019)	0.012 (0.014)	0.008 (0.036)	-0.003 (0.028)	0.022 (0.015)
25	-0.017 (0.018)	0.005 (0.012)			
26	-0.017 (0.018)	0.005 (0.012)			0.014 (0.013)
27	-0.019 (0.020)	0.005 (0.013)	0.020 (0.033)	0.004 (0.025)	0.015 (0.014)
28	-0.013 (0.021)	0.008 (0.015)	0.008 (0.036)	-0.002 (0.028)	0.020 (0.015)
29	-0.013 (0.021)	0.008 (0.015)	0.008 (0.036)	-0.002 (0.028)	0.020 (0.015)

^aNumbers in parentheses denote standard errors.

*Significantly different from zero at the 10% level.

SZ1	SZ2	SZ3	SZ4	MSM	Intercept	R ²
					-0.009 (0.008)	0.014
					-0.011 (0.008)	0.053
0.028 (0.020)	0.017 (0.024)	0.010 (0.027)			-0.033 (0.038)	0.145
	-0.012 (0.016)	-0.018 (0.020)	-0.028 (0.020)		-0.005 (0.031)	0.145
				-0.040* (0.024)	0.006 (0.012)	0.080
				-0.036 (0.025)	0.003 (0.012)	0.104
				-0.034 (0.025)	-0.001 (0.028)	0.116
0.023 (0.020)	0.014 (0.024)	0.004 (0.028)		-0.027 (0.027)	-0.019 (0.040)	0.171
	-0.009 (0.016)	-0.019 (0.020)	-0.023 (0.020)	-0.027 (0.027)	0.004 (0.032)	0.171

None of the variables are significant at the 10 percent level with the exception of MSM in run 25. The R^2 's are lower than in regressions with MS80 as dependent variable and MSM as independent variable but are roughly in line with regressions run without MSM as an independent variable. MSM is included in regressions 25 to 29 to account for the fact that, for a bank with a high market share, there is less of a possibility of a given percentage increase in market share than for a bank with a low market share. For example, a bank with a 10 percent initial market share could double its market share by gaining an additional 10 percent of the market where it would take 40 percent more of the market for a bank with an initial 40 percent market share. For this reason, one would expect the coefficient on MSM to be negative. However, the coefficient on MSM may be negative for a different reason. As MSM rises, MS80-MSM naturally falls. So if there is a measurement error in MSM, either high or low, it will tend to bias CMS in the opposite direction of the error. This would tend to cause the coefficient on MSM to be smaller than it would otherwise be.

To test which relationship is most important, the merged banks were divided in half at the median market share in 1972-1973 and regression number one was run on both halves of the sample. These results are listed in Table 9. For the lower half of the sample, run 40, the coefficient on MSM is significantly less than one at the 20 percent level, while for the upper half of the sample it is significant at only much higher levels. Run 40 suffers from a degrees of freedom problem since

Table 9. Regressions run on sample banks divided at the median with MS80 as dependent variable

Regression number	MSM	Intercept	Sample
39	0.990 (0.040) ^a	-0.013 (0.018)	upper half
40	0.917 ^f (0.088)	0.006 (0.008)	lower half

^aStandard errors in parentheses.

^fSignificantly different from one at the 20% level.

the sample size is only 21. This causes the level of significance to be much higher (20 percent) than would normally be reported.

The results of regressions 39 and 40 tend to contradict the explanation that large market share banks have a lower probability of increasing their market share by a given percentage than smaller banks. The statistically significant negative coefficient on MSM in regression 25 is, therefore, probably due to the mathematical bias.

Results with RMS as the dependent variable

The problem with using absolute change in market share is that it does not take into account where the bank started out in terms of market share. In order to alleviate this problem, regressions were run with relative change in market share (RMS) as the dependent variable. The results of those regressions are listed in Table 10.

Some interesting results come out of these regressions. The coefficient on MSO is significant at the 5 percent level in all runs. This suggests that banks with branches outside their head office market area tend to do better within that market area than do banks who confine their offices to their original county. The R^2 s are also much better than those runs in which CMS was the dependent variable, especially when MSO is included in the regression. These better results are probably due to RMS being a better overall measure of how market share changes since it includes initial position in the market which CMS does not.

Chapter V will summarize the results from all the regressions and suggest avenues for future research in this area.

Table 10. Regressions with RMS as dependent variable

Regression number	G	BHC	UB	LB	MSO
30	-0.048 (0.097) ^a	0.054 (0.069)			
31	-0.067 (0.093)	0.051 (0.066)			0.163** (0.072)
32	-0.048 (0.103)	0.016 (0.076)	0.010 (0.193)	-0.057 (0.148)	0.187** (0.078)
33	-0.048 (0.103)	0.016 (0.076)	0.010 (0.193)	-0.057 (0.148)	0.187** (0.078)
34	-0.103 (0.103)	0.035 (0.069)			
35	-0.108 (0.099)	0.035 (0.067)			
36	-0.113 (0.105)	0.036 (0.068)	0.122 (0.179)	0.045 (0.135)	0.160** (0.076)
37	-0.084 (0.110)	-0.003 (0.078)	0.009 (0.193)	-0.049 (0.148)	0.175** (0.079)
38	-0.084 (0.110)	-0.003 (0.078)	0.009 (0.193)	-0.049 (0.148)	0.175** (0.079)

^aNumbers in parentheses denote standard errors.

**Significantly different from zero at 5% level.

SZ1	SZ2	SZ3	SZ4	MSM	Intercept	R ²
					0.004 (0.046)	0.017
					-0.015 (0.044)	0.134
0.001 (0.104)	-0.135 (0.126)	-0.114 (0.146)			0.063 (0.203)	0.221
	-0.136 (0.085)	-0.115 (0.108)	-0.001 (0.104)		0.063 (0.163)	0.221
				-0.198 (0.137)	0.077 (0.068)	0.069
				-0.152 (0.133)	0.043 (0.067)	0.164
				-0.146 (0.137)	-0.005 (0.153)	0.175
0.026 (0.108)	-0.147 (0.127)	-0.145 (0.150)		-0.136 (0.145)	0.131 (0.216)	0.241
	-0.121 (0.086)	-0.119 (0.108)	0.026 (0.108)	-0.136 (0.145)	0.105 (0.170)	0.241

CHAPTER V: CONCLUSIONS AND SUGGESTIONS
FOR FURTHER RESEARCH

The purpose of this study was to look at what happens to a merged bank's market share post-merger and what factors affect how much market share changes. As is often the case in economic research, the results of the investigation differed from what had been expected.

With the continuing concern among the regulators of increasing concentration in banking markets due to merger, one would expect to find an increase in market share over time, especially by more aggressive merger-oriented banks. However, only one of the banks in the sample participated in a subsequent merger in the years 1973 to 1980, and even taking that acquired market share into account, it appears as if bank market share remains constant, perhaps even declining slightly in the seven years after the merger. This may well be due to the overall size of the banks in the sample, the average size is \$26M in DIPC. Extremely large banks tend to be excluded from the sample due to the criteria used to select the same. Smaller banks have experienced lower growth rates than larger banks in the period 1960-1971, as demonstrated in Rhoades-Yeats study previously mentioned (27). If this trend continued in the time period of the study, it may well account for the decline in market share post-merger.

What is perhaps most surprising is the lack of significance of most other variables tested. One would have expected growth in county or SMSA deposits to be negatively related to a change in market share. This would be true if higher growth meant greater entry. Perhaps if net

entry were accounted for directly instead of using growth as a proxy, the results might have been different. The dummy variable representing the type of branching, if any, allowed by the states, also seem to have little explanatory power. This is perhaps due to the fact that the majority of the mergers in the sample took place in limited branching states (see the Appendix). Again, the criteria used to select the sample seems to have created this problem. Enlarging the sample would probably bring about more variation. The sample could be enlarged by eliminating part of criteria one, making it necessary only that the banks face each other in one particular market. In other words, allow branches to exist outside the head office county or SMSA at the time of the merger. This would bring more mergers into the sample as well as raise the average bank size of the sample. The lack of significance of the various size dummy variable may also be related to the lack of a wide range of different size banks in the sample. Bank holding company acquisition appears to have little effect on market share for the banks in the sample. This does not mean that there are not advantages to becoming part of a holding company, such as increased profitability. Looking at profitability will be discussed later in this chapter.

The most interesting result is the positive and significant coefficient on MSO, the dummy variable which signifies whether or not the merged bank operates offices outside the original county or SMSA, as of 1980. This result indicates that perhaps there is some sort of market linkage between different banking markets. In other words, the existence

of offices outside a given banking market helps the bank from a competitive standpoint within their original market. For example, many of the bank's customers, especially business customers, may find it advantageous to bank with a firm that has offices spread over many different markets, as opposed to those confined to a local area only. Banks who branch outside their original market may also be more aggressive competitors within that original market. If these market linkages do exist, there may be some validity to claims by many regulators and economists of the importance of looking beyond just the effect on local banking markets.

One possible avenue for further research, in addition to expanding the sample size, would be to look at the profitability of these banks before and after the merger. Balance sheet data for FDIC insured banks is available from the regulatory agencies on the Report of Condition tapes. Ratios such as the return on assets or return on equity could be compared to non-merging banks in the same market. A study of this type would be of interest to bankers contemplating a merger, as well as the regulatory agencies. It is possible that a decline in DIPC market share may well occur in conjunction with increased profitability. For example, a decline in demand deposits relative to the market total may well be offset by a rise in other, perhaps more profitable, liabilities such as certificates of deposits or commercial paper. Looking at market share measured by some other variable, such as savings deposits or loans, as well as profitability, may provide some insights into bank behavior in various markets.

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APPENDIX: SAMPLE DATA

Table A1. Sample data

Merger number	MSM	MS80	MSO	G	BHC	UB	LB	SZ1	SZ2	SZ3	SZ4
A1	0.436	0.384	0	1.106	1	0	1	0	0	0	1
A2	0.572	0.638	0	0.642	0	0	1	1	0	0	0
B1	0.008	0.010	1	0.836	0	0	0	0	0	1	0
D4	0.289	0.244	0	1.167	0	0	1	0	1	0	0
E1	0.004	0.005	0	0.340	0	0	1	1	0	0	0
E2	0.091	0.091	0	0.600	0	0	1	1	0	0	0
E3	1.000	1.000	0	-0.282	0	0	1	1	0	0	0
E5	0.506	0.446	0	0.325	0	0	1	0	0	0	1
E6	0.452	0.375	0	0.346	0	0	1	1	0	0	0
E7	0.257	0.269	0	0.160	0	0	1	1	0	0	0
F1	0.160	0.100	1	0.431	0	0	1	1	0	0	0
F2	0.083	0.062	0	0.511	0	0	1	1	0	0	0
F3	0.905	0.846	0	-0.398	0	0	1	1	0	0	0
G1	0.224	0.238	0	0.186	1	0	1	0	0	0	1
G2	0.386	0.349	0	0.120	0	0	1	0	1	0	0
G3	0.104	0.130	0	0.044	0	0	1	1	0	0	0
J1	0.009	0.008	0	0.425	0	1	0	1	0	0	0
K1	0.062	0.047	0	0.641	1	0	0	0	1	0	0
H1	0.539	0.500	0	0.246	0	0	1	1	0	0	0
H2	0.480	0.451	0	0.215	0	0	1	0	1	0	0
H3	0.017	0.015	0	0.465	1	0	1	1	0	0	0
L5	0.003	0.004	1	0.469	1	0	1	0	0	0	1
L6	0.385	0.413	0	0.141	0	0	1	1	0	0	0
L7 ^a	0.120	0.153	1	0.395	1	0	1	1	0	0	0

M1	0.193	0.174	0	0.360	1	0	1	1	0	0	0
M3	0.030	0.041	1	0.372	0	0	1	1	0	0	0
M4	0.198	0.149	0	0.361	0	0	1	0	0	1	0
M6	0.433	0.498	1	0.394	0	0	1	0	1	0	0
M10	0.112	0.093	0	0.385	0	0	1	0	1	0	0
M11	0.188	0.182	0	0.326	0	0	1	1	0	0	0
M12	0.118	0.101	0	0.361	0	0	1	1	0	0	0
N1	0.112	0.132	0	0.237	0	0	1	1	0	0	0
N2	0.202	0.200	0	-0.066	0	0	1	1	0	0	0
N3 ^b	0.166	0.163	0	0.364	0	0	1	0	0	1	0
N4	0.091	0.119	0	0.313	0	0	1	1	0	0	0
N5	0.208	0.192	1	0.313	0	0	1	0	0	1	0
N6	0.112	0.119	0	0.522	0	0	1	1	0	0	0
N7	0.280	0.271	0	0.555	0	0	1	1	0	0	0
O2	0.060	0.072	0	1.084	1	1	0	1	0	0	0
Q1	0.045	0.046	0	0.254	1	0	1	1	0	0	0
S1	0.003	0.003	0	0.581	1	0	1	1	0	0	0
S2	0.264	0.220	0	0.523	0	0	1	1	0	0	0

^a Acquired market share = 0.033.

^b Boundary MSM of lower half of sample.