Understanding market concentration: internet-based applications from the banking industry

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Abstract

Market structure is an essential topic in economics and finance courses, including bank management as well as many other business school courses, for example marketing, human resources and strategic management. Instructors explain the virtues of perfect competition and the evils of monopoly along with alternative market models. Often conversations drift into discussing mergers and acquisitions, specifically why some mergers are approved while others are denied.

This paper provides instructors with a handy resource that assists students in understanding changes in market concentration using “real-world” banking examples and “what-if” scenarios. It also introduces the recently revised Department of Justice/Federal Trade Commission Horizontal Merger Guidelines. Finally the paper discusses several issues closely related to market concentration.

Keywords: Herfindahl Hirschman Index; Horizontal Merger; market concentration; FDIC; market share

Background

Market structure is concerned with a spectrum of economic organizations that range from pure competition at one extreme to pure monopoly at the other. In between are oligopolies with few firms and monopolistically competitive firms with many. So begins the discussion in most principles of economics classes. It does not, however, end there. In marketing classes students are concerned with the impact of market structure on pricing decisions. In finance courses, the focus may be on the impact that market structure has on the capital structure of firms and both their access to funds and the cost of financing. Entrepreneurship classes discuss the impact of competing in highly competitive markets while human resource classes may discuss how market concentration relates to compensation issues. The well-known strategic management works of Michael Porter are built around sustainability of competitive advantage that is linked to intensity of rivalry. (Porter, 1985) In short, issues related to the degree of market concentration are pervasive throughout contemporary business school curricula.

The microeconomic theory of the firm has been well developed and is typically introduced to students in principles of economics courses. For an illustration of a typical approach see O'Sullivan et. al. (O'Sullivan, Sheffrin, & Perez, 2010) The actual attempt to define and measure market concentration is often limited and in some instances is avoided entirely. As a matter of public policy, the measurement of market concentration is important and lies at the heart of decisions about whether to approve mergers and acquisitions that might pose a potentially harmful impact on consumers in terms of both prices and the availability of goods and services. (Bruner, 2004) These issues have been addressed by antitrust laws in the U.S. dating to the Sherman Antitrust Act in 1890. The Clayton Act in 1914, the Robinson Patman Act in 1936 and the Bank Holding Company Act in 1956 have each addressed various issues related to potential anti-competitive behavior. (Weston, Mitchell, & Mulherin, 2004)

A popular measure of concentration is the Herfindahl-Hirschman Index (HHI) which is widely used by policymakers including banking regulators to evaluate merger proposals. The HHI is calculated as the sum of the squared market shares of firms in a given market. (Horizonal Merger Guidelines, 1997) Suppose there are ten firms in a market in which each has a 10% market share. The HHI would therefore be $(10)^2 + (10)^2 + \ldots + (10)^2 = 1{,}000$. By contrast, a market with one firm that has a 50% share and five firms each with 10% share would have an HHI of $(50)^2 + (10)^2 + (10)^2 + \ldots (10)^2 = 3{,}000$. A pure monopoly market with a single firm holding a 100% market share would yield an HHI of $(100)^2 = 10{,}000$. Taken in isolation, these numbers are meaningless. Viewed against guidelines, however, they provide insight into possible competitive consequences of mergers. For an excellent discussion of competitive analysis in banking including illustrations of HHI analysis see Cetorelli. (Cetorelli, 1999).

The necessary benchmarks are provided by the U.S. Department of Justice/ Federal Trade Commission Horizontal Merger Guidelines which were revised in 1992 and 1997. (Horizonal Merger Guidelines, 1997) On April 20, 2010 the Justice Department and Federal Trade Commission released for public comment their latest guideline revisions. (Revised Horizontal Merger Guidelines, 2010) The public comment period was originally for 30 days but was later extended until June 4, 2010. The 1997 DOJ/FTC Guidelines are hereafter referred to as the "Old" guidelines while the 2010 version is designated as "New" guidelines.

Table 1
DOJ/FTC Horizontal Merger Guidelines

“Old” Guidelines		
Unconcentrated	HHI<1000	No action
Moderately concentrated	HHI>1000<1800	Red flag if ΔHHI>100
Highly concentrated	HHI>1800	Significant competitive concerns if ΔHHI>50
“New” Guidelines		
Unconcentrated	HHI<1500	No action
Moderately concentrated	HHI>1500<2500	ΔHHI>100 warrants scrutiny
Highly concentrated	HHI>2500	ΔHHI>100<200 warrants scrutiny ΔHHI>200 presumed likely to increase market power

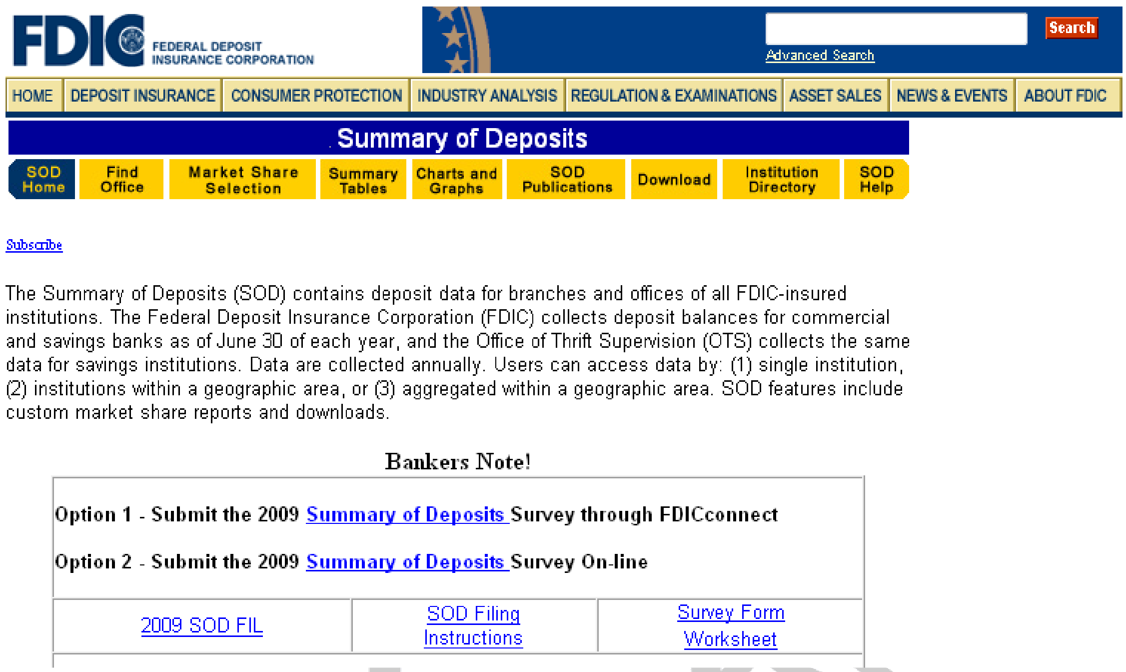
Source: U.S. Department of Justice/ Federal Trade Commission, 2010

According to analysis by the prominent Fried Frank law firm “the new guidelines are a substantial rewrite of the current ones and generally reflect (and do not depart from) current enforcement policy. Overall, they embrace a flexible fact-based approach to merger review that, among other things, reduces the role of market definition and endorses the use of a variety of tools and methodologies in determining whether a transaction is anticompetitive.” (Federal Antitrust Agencies Issue Horizontal Merger Guidelines, 2010) The Skadden Arps law firm noted “the proposed guidelines provide the government with far more flexibility in its integrated approach to merger investigations to determine whether a transaction may lead to a substantial lessening of competition and thus violate the U.S. antitrust law”. (Aronson, John, & Sunshine, 2010)

Accessing Banking Data on the Internet

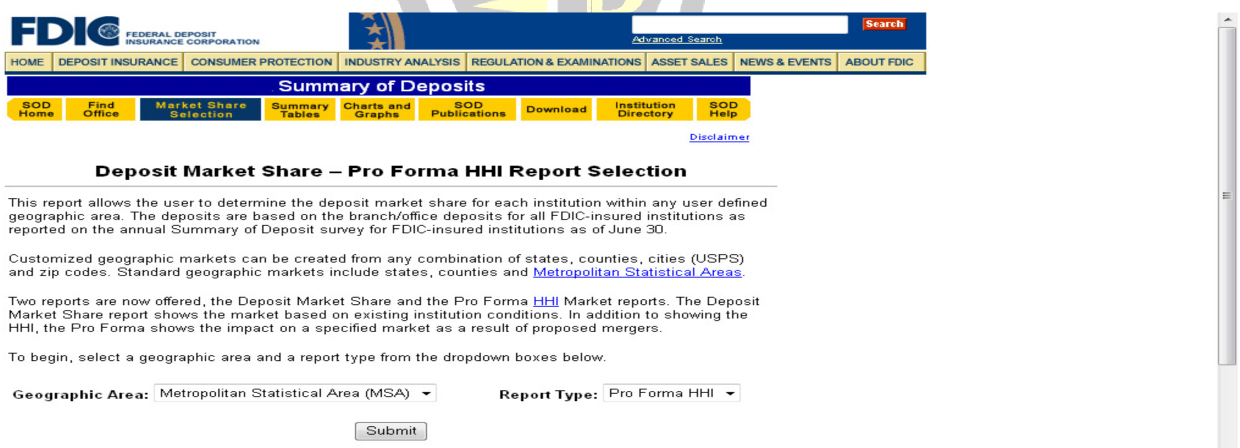
The Federal Deposit Insurance Corporation (FDIC) website provides a rich source of data for evaluating competitive market issues. Faculty and students will find the site contains balance sheet, income statement data and financial ratios for U.S. banks and bank holding companies, both quarterly and annually over multiyear periods. This data is required by law to be submitted by financial institutions quarterly (with a few exceptions) in a standardized reporting format which makes peer comparisons easy and meaningful. If banks are careless in reporting, they are subject to substantial fines. Updated data is generally available on the FDIC website (http://www.fdic.gov) in 55 days or less after the close of the quarterly financial period. The particular section used in this paper can be found directly by accessing the Summary of Deposits at http://www2.gov/sod/index.asp. A sample opening screen appears in Exhibit 1.

Exhibit 1 - FDIC Summary of Deposits



Having arrived at this webpage, simply click on "Market Share Selection" which will produce the screen in Exhibit 2.

Exhibit 2 - Market Share Selection



Deposit market share data for commercial banks is only available once per year and is based on the June 30th Report of Condition (call report). This is one of the reporting exceptions mentioned earlier. There are two options in selecting customized geographic markets. One option is to use state, county, city or zip code to define the market. The alternative is to select a Metropolitan Statistical Area (MSA) from a drop-down menu.

There are two available reports: a deposit market share report and a Pro Forma HHI report. For our purposes, the latter HHI report is relevant. For illustrative purposes the Kansas City MO/KS MSA is initially selected. The 15 county Kansas City MO/KS MSA population is currently around two million persons. The market share data for each bank in the market is available in the report. The incremental contribution of each bank to overall HHI is calculated automatically. The screen defaults to the most recent data which in this example is June 30, 2008 for deposits and June 30, 2009 for total assets.

Exhibit 3 - Kansas City MO/KS MSA Bank Market Share

Offices and Deposits of all FDIC-Insured Institutions

Preliminary Pro Forma Deposit Market Share Report

Deposits as of: June 30, 2008

Total Assets as of: June 30, 2009

Sorted by: Market Share

Create Final Report

Selected Market
Metropolitan Statistical Area(s):
KANSAS CITY, MO-KS

Acq	Merged	Institution Name	CERT	State (Hqtrd)	Bank Class	State/ Federal Charter	Total Assets as of June 30, 2009	Market Data June 30, 2008: No. of Offices	Deposits ($000)	Market Share	Squared Market Share
		BANK OF AMERICA NA	3510	NC	N	Federal	1,450,829,889	52	4,762,298	11.91%	141.8135
		COMMERCE BANK NATIONAL ASSN	24998	MO	N	Federal	17,507,545	48	3,836,489	9.59%	92.0349
		UMB BANK NATIONAL ASSN	8273	MO	N	Federal	8,384,948	40	3,380,507	8.45%	71.4576
		U S BANK NATIONAL ASSN	6548	OH	N	Federal	260,444,694	41	2,007,846	5.02%	25.2084
		BANK MIDWEST NATIONAL ASSN	32964	MO	N	Federal	4,042,752	38	1,921,640	4.81%	23.0902
		CAPITOL FEDERAL SAVINGS BANK	27981	KS	SA	Federal	8,350,222	18	1,603,964	4.01%	16.0869
		M&I MARSHALL&ILSLEY BANK	1020	WI	SM	State	52,970,837	11	1,546,798	3.87%	14.9607
		HILLCREST BANK	22173	KS	NM	State	1,864,352	23	1,462,132	3.66%	13.3677
		FIRST NB OF KANSAS	33789	KS	N	Federal	934,217	7	944,338	2.36%	5.5762
		H&R BLOCK BANK	58124	MO	SA	Federal	984,265	1	784,612	1.96%	3.8494

(The intermediate 145 banks are intentionally omitted to conserve space)

Number of Institutions in the Market: 155	TOTALS	2,485,526,771	783	39,990,586	100.00%
				HHI	445.0164

A Highly Competitive Banking Market

There are 155 institutions in the market with 783 offices in this illustration. The Kansas City market is one of the most competitive markets in the U.S. The largest market share, held by Bank of America is less than 12% of the market. Two regional banks, Commerce Bank and UMB, each with headquarters in Kansas City are #2 and #3 in market share with 9.59% and 8.45% respectively. From there the market share percentages drop quickly. H&R Block Bank, a banking subsidiary of the national tax preparation firm, is ranked at #10 by market share, with slightly less than 2% of the market. The aggregate HHI for the entire Kansas City MO/KS MSA is only 445, or less than one third of the maximum value for a competitive market under the new guidelines..

One unique feature of the market share section of the FDIC website is the ability to play "what-if" games. As seen in Exhibit 3, there is a circle and a small square to the left of each bank name. The circle is for designating an acquiring institution. By ticking the square, an acquired institution can be selected. Suppose, for example, that Commerce Bank ranked #2 acquires Bank

Midwest ranked at #5. Bank Midwest's 4.81% market share would be combined with Commerce.

Exhibit 4 - Effect of a Merger on HHI in Kansas City MO/KS MSA

Offices and Deposits of all FDIC-Insured Institutions

Final Pro Forma Deposit Market Share Report

Deposits as of June 30, 2008

Total Assets as of June 30, 2009

Sorted by Market Share

		Selected Market Metropolitan Statistical Area(s): KANSAS CITY, MO-KS						Market Data June 30, 2008			
Acq	Merged	Institution Name	CERT	State (Hqtrd)	Bank Class	State/ Federal Charter	Total Assets as of June 30, 2009	No. of Offices	Deposits ($000)	Market Share	Squared Market Share
A		New COMMERCE BANK NATIONAL ASSN	24998	MO	N	Federal	21,550,297	86	5,758,129	14.40%	207.3229
		Old COMMERCE BANK NATIONAL ASSN	24998	MO	N	Federal	17,507,545	48	3,836,489	9.59%	92.0349
	M	BANK MIDWEST NATIONAL ASSN	32964	MO	N	Federal	4,042,752	38	1,921,640	4.81%	23.0902
		BANK OF AMERICA NA	3510	NC	N	Federal	1,450,829,889	52	4,762,298	11.91%	141.8135
		UMB BANK NATIONAL ASSN	8273	MO	N	Federal	8,384,948	40	3,380,507	8.45%	71.4576

Number of Institutions in the Market: 154	TOTALS	2,485,526,771	783	39,990,586	100.00%	
					Post Merger HHI	537.2142
					Pre Merger HHI	445.0164
					Change in HHI Points	92.1978

As shown in Exhibit 4, a merger of Commerce Bank and Bank Midwest results in a "New Commerce Bank" with a 14.40% market share which would become the #1 bank in the market by deposits. The HHI rises from 445 to 537 or a change of 92. Because the post-merger HHI is substantially below both the "old" threshold of 1,000 as well as the "new" 1,500 threshold for becoming moderately concentrated, it is unlikely to be opposed by the Federal Reserve or the Justice Department.

A Moderately Concentrated Banking Market

This exercise is useful in generating discussions about market concentration. If the instructor accesses the FDIC website for a live classroom discussion, it is often fun to let students pick an MSA of their choice. In effect, each bank they choose becomes a "live" case and stimulates some exciting discussion. Students quickly become engaged, especially in cases where they have some direct knowledge or association. For example, in a graduate class students may choose the site of their undergraduate study like Columbia, MO or Lawrence, KS. If we take Columbia, MO as an example, students will quickly notice that size of the town may not correlate with the degree of competition. (Columbia's current population is around 100,000). In Columbia, MO, one bank-- Boone County National Bank has a 34% market share which contributes to a pre-merger HHI of 1,656, which represents a moderately concentrated market even under the "new" guidelines.

Suppose that once again the second largest bank in the market, First National Bank & Trust, acquires the fifth largest bank, Premier Bank. The resulting post-merger HHI jumps by 147 to 1,803 which well below the highly concentrated threshold under the “new” guidelines although the change in excess of 100 could still draw regulatory scrutiny. Discussion then ensues about whether the Federal Reserve might approve such an acquisition and what the effect might be on remaining market concentration. Would there be any additional requirements imposed such as the sale of one or more branches? Would the consumer be likely to experience any adverse consequences from such a merger?

Exhibit 5 - A Proposed Merger in the Columbia, MO Market

Offices and Deposits of all FDIC-Insured Institutions

Final Pro Forma Deposit Market Share Report

Deposits as of June 30, 2008

Total Assets as of June 30, 2009

Sorted by Market Share

		Selected Market Metropolitan Statistical Area(s): COLUMBIA, MO						Market Data June 30, 2008			
Acq	Merged	Institution Name	CERT	State (Hqtrd)	Bank Class	State/ Federal Charter	Total Assets as of June 30, 2009	No. of Offices	Deposits ($000)	Market Share	Squared Market Share
		BOONE COUNTY NB OF COLUMBIA	4536	MO	N	Federal	1,155,505	15	849,889	34.17%	1,167.4371
A		New FIRST NATIONAL BANK&TRUST CO	4537	MO	N	Federal	2,884,028	12	500,366	20.12%	404.6548
		Old FIRST NATIONAL BANK&TRUST CO	4537	MO	N	Federal	1,414,483	9	380,776	15.31%	234.3410
	M	PREMIER BANK	34016	MO	NM	State	1,469,545	3	119,590	4.81%	23.1153
Number of Institutions in the Market: 22						TOTALS	1,887,242,122	72	2,487,399	100.00%	
										Post Merger HHI	1,803.3863
										Pre Merger HHI	1,656.1878
										Change in HHI Points	147.1985

A Highly Concentrated Banking Market

The analysis of market concentration may be extended by selecting a highly concentrated market where the pre-merger HHI substantially exceeds the “new” 2,500 threshold. Markets such as Charlotte NC with Wachovia (69% of the market) and Bank of America (19%) are extremely concentrated with an aggregate HHI of 5,182 with only 48 institutions in the Charlotte MSA. (Note: This example occurs before the December 31, 2008 merger of Wachovia with Wells Fargo).

Exhibit 6 - A Highly Concentrated Charlotte NC Banking Market

		Selected Market Metropolitan Statistical Area(s): CHARLOTTE-GASTONIA-CONCORD, NC-SC						Market Data June 30, 2008			
Acq	Merged	Institution Name	CERT	State (Hqtrd)	Bank Class	State/ Federal Charter	Total Assets as of June 30, 2009	No. of Offices	Deposits ($000)	Market Share	Squared Market Share
		WACHOVIA BANK NATIONAL ASSN	33869	NC	N	Federal	560,556,000	80	75,515,762	69.28%	4,800.2774
		BANK OF AMERICA NA	3510	NC	N	Federal	1,450,829,889	57	20,848,398	19.13%	365.8782
		BRANCH BANKING&TRUST CO	9846	NC	NM	State	147,643,909	55	3,438,361	3.15%	9.9516
		FIFTH THIRD BANK NA	32712	TN	N	Federal	6,861,013	34	1,846,996	1.69%	2.8716
		SUNTRUST BANK	867	GA	SM	State	170,139,951	35	1,188,163	1.09%	1.1883
		FIRST-CITIZENS BANK&TRUST CO	11063	NC	NM	State	14,603,056	31	875,475	0.80%	0.6452
		RBC BANK USA	33184	NC	SM	State	29,851,580	18	776,149	0.71%	0.5071
		NEWDOMINION BANK	57888	NC	NM	State	561,657	4	389,800	0.36%	0.1279
Number of Institutions in the Market: 48						TOTALS	2,569,727,327	432	108,994,464	100.00%	
										HHI	5,182.0919

There are special issues associated with highly concentrated markets. First, under the "new" guidelines, a post-merger change in the HHI of between 100 and 200 may draw regulatory attention. A change above 200 is presumptive of increased market power. The Charlotte NC market is unique with the top two banks accounting for almost 90% of the market. The third ranked bank has only a 3% market share. The fourth and fifth ranked banks have less than 2%. In most HHI calculations, market shares of less than 2% are dismissed as inconsequential in terms of overall market concentration. Nevertheless, mergers between firms in a highly concentrated market are still possible if both firms have small shares of the market and can receive regulatory approval as is illustrated in Exhibit 7.

Exhibit 7 - Small Bank Merger in Charlotte NC Market

A		New FIRST-CITIZENS BANK&TRUST CO	11063	NC	NM	State	15,164,713	35	1,265,275	1.16%	1.3476
		Old FIRST-CITIZENS BANK&TRUST CO	11063	NC	NM	State	14,603,056	31	875,475	0.80%	0.6452
	M	NEWDOMINION BANK	57888	NC	NM	State	561,657	4	389,800	0.36%	0.1279
Number of Institutions in the Market: 47						TOTALS	2,569,727,327	432	108,994,464	100.00%	
										Post Merger HHI	5,182.6664
										Pre Merger HHI	5,182.0919
										Change in HHI Points	0.5745

In this example, First-Citizens Bank & Trust, the sixth ranked bank in the market, acquires New Dominion Bank, the eighth ranked bank. The resulting change in the HHI is 0.57. Even though these banks are ranked in the top ten in a highly concentrated market, the proposed merger is likely to be approved by banking regulators since the change in HHI is well under the Δ100 threshold that might draw notice.

Another interesting but highly concentrated market is Sioux Falls SD where Citibank has 62.6% of the market and US Bank has another 30.5%. Banks have moved their charters to South Dakota to take advantage of favorable banking laws. Citibank also has a national credit card operation in South Dakota as well. The Sioux Falls market has 35 institutions with an aggregate HHI of 4,855.

Exhibit 8 - A Highly Concentrated Sioux Falls SD Market

		Selected Market Metropolitan Statistical Area(s): SIOUX FALLS, SD						Market Data June 30, 2008			
Acq	Merged	Institution Name	CERT	State (Hqtrd)	Bank Class	State/ Federal Charter	Total Assets as of June 30, 2009	No. of Offices	Deposits ($000)	Market Share	Squared Market Share
		CITIBANK SOUTH DAKOTA N A	23360	SD	N	Federal	96,276,510	1	39,522,029	62.64%	3,924.2789
		WELLS FARGO BANK NA	3511	SD	N	Federal	539,621,000	15	19,210,360	30.45%	927.1551
		FIRST NB IN SIOUX FALLS	4016	SD	N	Federal	1,157,408	18	662,752	1.05%	1.1035
		HOME FEDERAL BANK	28092	SD	SA	Federal	1,175,670	20	569,903	0.90%	0.8160
		FIRST PREMIER BANK	6085	SD	SM	State	1,022,876	8	520,649	0.83%	0.6810
Number of Institutions in the Market: 35						TOTALS	913,120,265	139	63,089,822	100.00%	
										HHI	4,855.2777

Assume that Citibank SD acquires First National Bank in Sioux Falls. What are the chances of regulatory approval? The results are shown in Exhibit 9.

Exhibit 9 - A Large Bank/Small Bank Merger

		Selected Market Metropolitan Statistical Area(s): SIOUX FALLS, SD						Market Data June 30, 2008			
Acq	Merged	Institution Name	CERT	State (Hqtrd)	Bank Class	State/ Federal Charter	Total Assets as of June 30, 2009	No. of Offices	Deposits ($000)	Market Share	Squared Market Share
A		New CITIBANK SOUTH DAKOTA N A	23360	SD	N	Federal	97,433,918	19	40,184,781	63.69%	4,056.9963
		Old CITIBANK SOUTH DAKOTA N A	23360	SD	N	Federal	96,276,510	1	39,522,029	62.64%	3,924.2789
	M	FIRST NB IN SIOUX FALLS	4016	SD	N	Federal	1,157,408	18	662,752	1.05%	1.1035
Number of Institutions in the Market: 34						TOTALS	913,120,265	139	63,089,822	100.00%	
										Post Merger HHI	4,986.8916
										Pre Merger HHI	4,855.2777
										Change in HHI Points	131.6139

The change in the post-merger HHI is 131.6 which, under the "new" guidelines is in the >100<200 bracket that may warrant scrutiny. It would be the responsibility of Citibank to make the case why an exception should be made. The promise of divestiture of assets is a possible incentive for approval. For example, First National Bank has 18 offices. It might, as a precondition for approval, agree to sell some of these branches to other banks.

If First National Bank were instead to merge with another smaller bank in the same market, the resulting post-merger HHI would likely be substantially less than 100 and therefore be likely to be approved under the "new" rules.

Topics for Extended Discussion

The preceding discussion of the mechanics of HHI analysis and the basics of market concentration merely sets the stage for a number of other related topics that enhance student understanding and promote student engagement in classroom discussions. The instructor can choose the issues and lead the discussion of these topics.

The Impact of the recent economic and financial crisis

The recent massive economic and financial crisis creates an environment for engaging students on a variety of topics. The magnitude and timing of events along with the personal impact of the crisis on individual students creates a natural interest. Relative to the market concentration question, students may wonder "How do the horizontal merger guidelines apply when large institutions buy other large institutions"? That is a great question! Bank of America acquired Countrywide as well as Merrill Lynch. Wells Fargo acquired Wachovia. JP Morgan purchased Bear Stearns. In addition, investment banks such as Goldman Sachs have changed organizational form and have become bank holding companies thus affecting market concentration in those markets where they operate.

In the end, the simple answer is desperate times call for desperate measures. The newly revised DOJ/FTC Horizontal Merger Guidelines contain a specific provision for failing firms. This allows distressed firms to overcome antitrust concerns.

> *…a merger is not likely to enhance market power if imminent failure, as defined below, of one of the merging firms would cause the assets of that firm to exit the relevant market. This is an extreme instance of the more general circumstance in which the competitive significance of one of the merging firms is declining: the projected market share and significance of the exiting firm is zero. If the relevant assets would otherwise exit the market, customers are not worse off after the merger than they would have been had the merger been enjoined.* (Revised Horizontal Merger Guidelines, 2010)

This does not mean that Congress will not alter antitrust and merger standards as they craft reforms following the economic and financial crises. Public criticism over further concentration of banking power could pressure Congress toward actions to reduce market concentration. This could create an interesting classroom debate on the merits of enhancing large scale financial institutions in times of crisis versus allowing market power to continue.

Market concentration versus bank pricing

Economic literature has long suggested that monopoly markets tend to be associated with higher prices and lower output, *ceteris paribus*, compared to competitive markets. This leads economists to discuss the *deadweight loss* of monopoly.

Using the MSAs from earlier discussions, HHI can be compared to quantitative performance measures like yield on earning assets (YoEA) and cost of funds (CoF) in Exhibit 10.

Exhibit 10 - HHI, Yield on Earning Assets and Cost of Funds

Metropolitan Statistical Area (MSA)	Herfindahl Hirschman Index (HHI) for MSA	Yield on Earning Assets (YoEA) Year-end 2008 Median values	Cost of Funds (CoF) Year-end 2008 Median values
Kansas City MO/KS	445	6.26%	2.48%
Columbia MO	1656	6.46%	2.67%
Charlotte-Gastonia-Concord NC/SC	5182	6.11%	3.01%
Sioux Falls SD	4855	6.29%	2.96%

Comparing the median values for yield on earning assets (YoEA) in each MSA for year-end 2008 reveals that the Kansas City MO/KS market, one of the most competitive markets in the U.S. has rates that are only 3 basis points different from the Sioux Falls SD MSA, one of the most concentrated. [Median values are used instead of mean values to adjust for the effect of bank size as well as the disparity in the number of institutions in a given MSA] Moreover, the lowest yield on earning assets is the Charlotte NC MSA with a mere 6.11% which is 15 basis points lower than Kansas City. Economic theory would suggest that extremely competitive markets such as Kansas City should have lower rates on earning assets. Such a finding can lead to interesting discussions, especially in a bank management course. A possible explanation could lie in differences in the asset mix, especially the loan portfolio composition for banks in different MSAs.

Theory would suggest that the cost of funds (heavily affected by the interest rates paid on deposits) is higher in more concentrated markets as banks exert their market power to pay lower rates to depositors. Ironically, Charlotte NC, the most concentrated market among the four has the highest cost of funds. Kansas City, the most competitive market, has the lowest cost of funds. Again, in discussing possible explanations, one possibility lies in the mix of liabilities used by banks in different markets. Charlotte NC, with large banks such as Wachovia and Bank of America may have a different liability mix than banks in Kansas City.

Another possible explanation for variations is that technology and the development of electronic banking has created a cyber market where consumers are no longer constrained by geography. Instead, the consumer can sit at home or at the office and check deposit and loan rates anywhere in the country. Websites like bankrate.com and LendingTree.com make such a search convenient and inexpensive. Transactional bank websites make it possible for consumers to act upon rate information.

{Authors names intentionally omitted} (XXX, XXX, & XXX, 2009) using regression models find market concentration is not statistically related to measures of bank pricing including the yield on bank assets and the bank's cost of funds. By contrast, the study finds that Internet access is statistically correlated to both yields and cost of funds.

Some final observations and caveats

There are numerous other issues related to this exercise. Instructors may wish to pursue some of these in order to provide a thorough treatment of market concentration and its implications. These issues are outlined below.

Technology has blurred traditional geographic markets.

Banking markets have been traditionally defined in geographic terms usually anchored by the location of the head office of the bank. A bank's market is normally an area that generates 75% of its individual, partnership and corporation deposits (IPC). With the rise of on-line banking, that market definition has been blurred. A consumer can log on their computer and quickly peruse sites such as bankrate.com, Ditech.com, LendingTree.com or scores of other sites where they can search for and find the best available rates on deposits and loans. One Midwestern bank, for example, at the height of the housing boom generated about $1.5 billion in Internet-based mortgage loans even though the bank itself was only $600 million in assets.

The creation of cyber-markets has presented challenges for banking regulators who must apply laws and regulations that presume geographic market definitions. For example, in enforcing the Community Reinvestment Act (CRA), how does one define the market for evaluating the low-to-moderate income segment of the population?

Changing Regulatory Definitions of Markets

At one time Federal banking regulators focused narrowly on other bank competitors when evaluating applications for mergers as well as branching applications. Furthermore, very small changes in concentration might be sufficient to deny a merger application for adverse competitive reasons. At times mergers were sometimes thwarted by the doctrine of probable future competition which argues that removing competition, even if it has no immediate consequences, might eliminate future competition that would have otherwise existed. Over time, regulators have recognized the importance of non-bank competition, including thrifts, credit unions, credit card companies, captive finance subsidiaries of auto companies and a variety of other financial firms. Today, with favorable legislative accommodation, this competition has extended to include investment firms, insurance companies, and mortgage companies and others. This has reduced but not totally eliminated anti-competitive concerns.

Multi-product and service markets can be different than aggregate markets

Financial institutions, particularly commercial banks, are by their nature multi-product, multi-service organizations. As such, a bank may enjoy imperfectly competitive submarkets in some regions of the country or across some product lines, while being subjected to highly competitive markets in others. As pointed out earlier, the Kansas City MO/KS market is intensely competitive as measured by HHI while the Charlotte NC is highly concentrated. Bank of America experiences the intense competition in Kansas City but a far different competitive environment in its Charlotte headquarters.

Summary

In summary, the FDIC website presents a convenient mechanism for using current real-world data to illustrate the calculation of market concentration. From there, instructors have an opportunity to develop a engaging discussion of the consequences of market concentration including the historical changes in both metrics and public policy. The end result, hopefully, is a more thorough understanding by students of why and how these are important issues. *Additional suggestions for classroom use are contained in a supplementary teaching note that is available upon request to instructors.*

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(PLEASE SEE ATTACHED TEACHING NOTE)

Teaching Note to Accompany "Understanding Market Concentration: Internet –based Applications from the Banking Industry

In our paper "Understanding Market Concentration: Internet-based Applications from the Banking Industry" we provide the necessary background for discussing the topic of market concentration and guide the reader through the process of accessing data. We further suggest topics to extend and develop additional discussion. In this note we describe a classroom exercise to solidify student understanding of the topics. We also provide suggestions for more advanced topics that can be developed by the instructor.

A Classroom Group Exercise

We suggest an exercise in which the instructor divides the class into groups. Each group either selects or is assigned a market (the market can be a Metropolitan Statistical Area [MSA], or a city or state). Students will need access to either a laptop or desktop computer with Internet capability, preferably high speed. Each team is given 20-30 minutes to answer the following questions:

---What is the market that your team has analyzed? Using the Herfindahl-Hirschman Index, how competitive is the market? Is the market dominated by one or two banks?

---If a merger were to be proposed between one of the top banks in the market and a mid-market share bank, would it likely be approved?

---If a hypothetical merger were to occur between any pair of banks in the market, does the likelihood of merger approval change?

---Are there any special considerations involving this market?

At the end of the preparation period, each team has an opportunity to make a five minute presentation on the answers to these questions. Class discussion and Q&A ensues. The instructor can conclude the discussion by summarizing the differences between markets, elaborating upon and extending any special issues and noting the advantages of quantifying the measurement of market concentration.

An Advanced Discussion

In some instances including economics courses or commercial bank management courses the instructor may final a natural segue into other more advanced topics. For example, we discussed in our paper the question of how market concentration relates to the yield on earning assets or to the cost of funds. An instructor can easily access data on individual banks or bank holding companies from the FDIC website at http://www2.fdic.gov/sdi/main.asp using the Statistical Data Interchange (SDI) procedure which is detailed on-line. Pre-calculated financial ratios as well as peer group data are available including return on average assets, return on average equity, cost of funds, asset yields, capital, efficiency ratios and liquidity measures among many others. Additional financial data including the Uniform Bank Performance Report (UBPR) is also available from the Federal Financial Institutions Examination Council (FFIEC) at http://www.ffiec.gov/ubpr.htm.

An instructor can then note the impact of market concentration on financial performance measures. This may lead to the conclusion as noted in the paper that market concentration may

NOT have adverse competitive effects on bank costs, revenues or performance measures. This in turn leads to discussion of whether public policy and regulation of competition is necessary. It also raises a discussion of the role that technology plays in permitting competition to transcend geographic boundaries.

Conclusion

We have found that using the FDIC website to discuss real live banking cases stimulates student enthusiasm and leads to interesting and enlightening discussions of issues relating to the current state of market concentration. Recent revisions of the U.S. Justice Department/ Federal Trade Commission *Horizontal Merger Guidelines* in 2010 has stimulated a renewed interest in the public policy implications of market concentration as well as its impact on day-to-day business operations. The free and easy availability of banking data from the FDIC website makes it possible to create classroom examples “on the fly” using real data. This is particularly appealing to Gen Y learners.