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# LOCAL OR STATE? EVIDENCE ON BANK MARKET SIZE USING BRANCH PRICES

- Each Federal Reserve Bank defines the banking markets in its District at the local rather than the state level. The effect of bank mergers on market competition depends crucially on this definition of size, as competition could be stifled if the combined deposit share of two merging banks in one market is too large.
- The elimination of state laws against branching now enables banks to compete across states—implying that banking markets are getting bigger and spurring a “local or state?” debate over market size.
- An analysis of bank market size suggests that branch prices—the amount a bank pays to buy another bank’s branches—may be a better indicator of size than the current measure, bank deposit rates.
- The results indicate that banking markets are not necessarily local. Prices for bank branch sales in ten northeastern states over the 1990s are more closely correlated with bank concentration at the larger, state level than at the local level.

## 1. INTRODUCTION

Geographic markets are currently defined by market analysts at each of the twelve Federal Reserve Banks, with oversight by the Federal Reserve Board and even the U.S. Supreme Court. In 1963, in *U.S. v. Bank of Philadelphia*, the Court ruled that the market for bank deposits is local. That 1963 ruling still unifies market analysis at each of the twelve Reserve Banks. The flavor of analysis differs somewhat across Banks, but the stock is the same. Analysts stake off their District into *local* markets: either metropolitan statistical areas (MSAs) or small groups of rural counties. Once they have designated the markets, analysts keep tabs on the distribution of deposits at banks operating in the markets.<sup>1</sup>

Designating the market correctly matters a lot when it comes to bank mergers. Suppose one bank wants to buy another bank that operates in the same designated market. If the banks’ combined share of deposits in that market is too large, regulators may frown upon the merger because it might stifle competition. Some bankers push back by challenging the Fed’s designated markets; “we are not too large,” bankers sometimes contend, “your designated market is too small.”

To be fair, a lot has changed since the Supreme Court decreed that bank deposit markets are local. Competition across markets was limited then by state laws against branching. With those laws gone, banks can now just build

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or buy a branch in another city if doing so seems profitable.<sup>2</sup> Technology has also improved. Circa 1963, savers deposited and withdrew funds in person, so local nearby banks had a distinct advantage over more remote competitors. Now savers can bank at far-flung ATMs or via phone or Internet, so location matters less. In a study of European banking markets, Corvoisier and Gropp (2001) find that market *contestability*—the threat of competition from potential entrants—increases with the number of Internet hosts per capita. Better information technology has also lowered the costs of managing widespread branch networks (Berger and DeYoung 2002).

In view of these changes, Radecki (1998) challenges the local-market paradigm. He observes that banks with branches in multiple markets tend to pay the same deposit rates all over the state. Moreover, deposit rates depend more on bank concentration (a proxy for competition<sup>3</sup>) at the state level than at the local level. Hannan and Prager (2001) challenge some of Radecki's results—they find more differences in deposit rates across markets—but even they still concede that the growing role of multimarket banks tends to blur market boundaries.

Part of the disagreement over market size stems from data limitations. As Biehl (2002) points out, comparisons of deposit rates across banks in different locations can be misleading; if deposits differ across two cities, does it mean that the cities represent different markets, or that banks in those cities offer different levels of service? Comparing profits would be preferable (because profits capture differences in prices *and* services), but profits at the branch level are not available to researchers.

The branch prices we study are less limited. Increasingly, banks are entering new markets by buying one or more branches from other banks (Benz 1998). The price of a given branch should depend on the branch's expected profits, and expected profits, in turn, depend on competition. All else equal, branches in less competitive (that is, more concentrated) markets will fetch higher prices because the absence of competition enables branch owners to lower deposit rates or service levels (or both).

Using prices on 110 branch deals over 1992-99 in ten northeastern states, we run a type of "horse race" to determine whether branch prices depend more on concentration at the local level (as the local-market paradigm implies) or at the larger, state level. Our branch price data seem to work well in the sense that branch prices are always correlated with concentration at one level or another. Some of the specific

<sup>1</sup>The District flavor enters in how analysts decide to group or divide rural counties into a designated market (DiSalvo 1999).

<sup>2</sup>Branching is less expensive than chartering a whole new bank with its own capital, board, and management (as was required before).

<sup>3</sup>We discuss the use of bank concentration as a proxy for competition later.

findings are consistent with the state-market hypothesis; across all years in our sample, branch prices are more closely correlated with bank concentration at the state level than at the designated market level. State-level concentration also tends to matter more for branch prices in dollars and cents, not just in statistical terms. However, the correlation between branch prices and state concentration depends partly on how we cut the data, so we cannot conclude entirely in favor of the state-market hypothesis. Branch price data certainly advance the local-versus-state debate, and with enough such data, that question might be settled once and for all.

The next section discusses conceptual definitions of markets and summarizes actual Federal Reserve practices in designating markets. Section 3 reviews some of the evidence on market size, most of which, it should be admitted, favors the local-market hypothesis. In Section 4, we present our findings, showing that branch prices also depend on concentration at the state level, not just at the local level. Section 5 discusses robustness and caveats.

## 2. BANKING MARKET DEFINITIONS: CONCEPTS AND PRACTICES

By "market," we mean the market for bank deposits in particular. Banks sell loans and many other services, of course, but in its 1963 ruling, the U.S. Supreme Court accepted the argument that antitrust analysts can use deposits as a proxy for the full "cluster" of banking services. Without that assumption, market analysis would forever beg "market for *what*?" questions.

So how big is the deposit market? The U.S. Department of Justice, the main antitrust agency, suggests that the market for deposits (or *any* product for that matter) can be viewed as:

a region such that a hypothetical monopolist . . . would profitably impose at least a "small but significant and nontransitory" increase in price.<sup>4</sup>

The key word in that definition is *profitably*. The monopolist just represents a hypothetical case where the conjectured market is so small—a city block, for example, or a village—that a single provider could serve it. Suppose the hypothetical monopolist tried to raise prices (or lower deposit rates) in the conjectured market. If savers flock to another nearby bank or branch, or if another bank steps in and offers higher deposit rates, the monopoly bank's attempt to raise prices will be *unprofitable*, and hence, transitory. Thus, the conjectured market is too small.

<sup>4</sup>See <[http://www.usdoj.gov/atr/public/guidelines/horiz\\_book/12.html](http://www.usdoj.gov/atr/public/guidelines/horiz_book/12.html)>.

The Justice Department guidelines above are more of a thought experiment, or a conceptual view. In practice, analysts at the twelve Federal Reserve Banks designate markets using simpler analysis. Following the Supreme Court’s decree, most analysts define markets as MSAs or groups of rural counties, then fine-tune the definitions using commutation patterns between locales reported in the U.S. census (DiSalvo 1999). Sufficiently high commuting between two rural counties, for example, might justify treating the counties as part of the same market.

The local-market paradigm implies about 2,000 banking markets in the United States (Table 1). The number and size of markets vary considerably across Federal Reserve Districts, ranging from about 3,500 square miles in the densely populated New York District to just 1,400 square miles in the sparsely populated Kansas City District. A sparsely populated region does not necessarily imply small markets, however. For example, analysts in Minneapolis judge that markets in their District are larger than those in the New York District, even though their population is sparser than the population in the Kansas City District. Note the vast range of deposits per market, too: \$31.2 billion per market in New York, versus just \$379 million per market in Kansas City.

TABLE 1  
Summary of Banking Market Definitions  
by Federal Reserve Bank

Bank	Number of Markets	Population Density of District	Population per Market	Square Miles per Market	Deposits per Market (Millions of Dollars)
Boston	86	193.2	145,488	753.2	2,217.6
New York	15	464.2	1,638,095	3,529.0	31,265.5
Philadelphia	33	327.9	359,018	1,095.0	4,611.5
Cleveland	120	224.2	137,029	611.3	2,072.8
Richmond	194	162.8	129,458	795.3	1,719.9
Atlanta	288	131.1	124,629	950.6	967.7
Chicago	256	164.4	123,928	753.7	1,423.6
St. Louis	266	74.5	45,575	611.4	544.7
Minneapolis	102	18.6	76,365	4,108.9	1,002.1
Kansas City	359	28.9	40,549	1,404.7	379.9
Dallas	267	57.6	77,051	1,336.6	667.0
San Francisco	132	39.9	NA	NA	NA

Source: DiSalvo (1999).

### 3. EVIDENCE ON BANK MARKET SIZE

Researchers have considered a variety of evidence on bank market size, ranging from “how far is your bank?” types of survey questions to more technical studies of how bank deposit and loan rates relate to market concentration.

#### 3.1 Survey Findings

According to the Survey of Consumer Finance, a periodic survey conducted by the Federal Reserve, the median distance between households and their primary depository institution in 1999 was just three miles, the same as it was in 1989 (Amel and Starr-McCluer 2001). Savers also stay with the same nearby bank for a long time; Kiser (2002) finds that the median tenure of a household’s main bank is ten years. When savers do switch banks, the most common reason cited is relocation, suggesting the importance of having a local provider.

Small business borrowers like their banks nearby as well (and vice versa, presumably), but the distance between them has grown. According to the Federal Reserve’s National Survey of Small Business Finance, the distance between the typical small firm and its bank lender in 1970 was just sixteen miles, compared with sixty-eight miles in the 1990s (Petersen and Rajan 2000). The four-fold increase suggests some expansion of banking markets, but at sixty-eight miles, the latest figure implies that markets remain relatively local.

This survey evidence shows convincingly that savers and borrowers like to be close to their banks, but it does not tell us how far banks will travel when they see profit opportunities in another market. Back when states limited branching, a bank could not simply branch into another city if savers there seemed underserved. Now banks can branch freely, so the relevant market, from the suppliers’ (banks’) perspective, could be growing even if demanders (savers) remain close to their banks.

#### 3.2 Uniform Pricing

Stigler (1966, p. 86) defines a market as “the area within which the price of a commodity tends toward uniformity.” If prices differ across two regions, those regions must represent different markets.

Radecki (1998) observes that large multimarket banks operating in the six most populous states (New York, Michigan, Texas, California, Pennsylvania, and Florida) tend to pay similar deposit rates all over the state, and that deposit

rates are increasingly correlated with *state*-level concentration. Banks see the market as the whole state, he concludes. Hannan and Prager (2001) reaffirm the correlation between deposit rates and *local* concentration using more recent data, but they confirm that the concentration-price relationship weakens as the share of multimarket banks grows. Heitfield and Prager (2002) revisit the uniform-pricing finding using a larger data set. Rates on checking still differ significantly across markets (MSAs) within a state, they find, suggesting that the market for checking accounts remains local.<sup>5</sup> NOW account and money market deposit account rates are correlated with both local- and state-level banking concentration, but state-level concentration matters more in more recent years.

As Biehl (2002) observes, differences in deposit rates might reflect different products, rather than different markets. Perhaps deposit rates in *A* are lower, but services (such as minimums) are higher. Profits are preferable to deposit rates, as profits capture any additional revenues earned by banks in less competitive markets as well as any additional savings to banks achieved by cutting back on deposit services. The branch prices we study later are closer to profits, so they may be more informative.

### 3.3 The Price-Concentration Relationship

For a given market definition, analysts measure deposit market concentration using the Herfindahl-Hirschman Index (HHI). If deposits at bank  $i = S_i$  percent of market deposits, *market*  $HHI = \sum_i S_i^2$ . The HHI ranges from 0 (infinitely many banks with an infinitesimal deposit share) to 10,000 (one bank with 100 percent of deposits). According to Department of Justice guidelines, a market with an HHI below 1,000 is unconcentrated, a market with an HHI between 1,000 and 1,800 is moderately concentrated, and one with an HHI above 1,800 is highly concentrated.<sup>6</sup>

The Justice Department guidelines presume that higher concentration indicates less competition. Researchers call this the structure-conduct paradigm: if market structure is highly concentrated, firm conduct will be uncompetitive. Some economists argue that the structure-conduct paradigm is

<sup>5</sup>Differences in deposit rates across two cities certainly imply different markets, but uniform rates *do not* necessarily imply a single market (Heitfield and Prager 2002).

<sup>6</sup>See <[http://www.usdoj.gov/atr/public/guidelines/horiz\\_book/15.html](http://www.usdoj.gov/atr/public/guidelines/horiz_book/15.html)>. According to Department of Justice bank merger guidelines, bank mergers in predefined markets will not raise competitive concerns as long as 1) the post-merger HHI does not exceed 1,800 and 2) the merger increases the HHI by more than 200. If the 1,800/200 screen is violated, applicants may be required to provide additional information to assure that competition will not suffer.

exactly backward—conduct dictates structure, not vice versa. Better performing banks (those that offer less expensive or better services) will wind up with a larger market share. Thus, concentration may reflect greater efficiency, rather than lack of competition.

These differing views predict nearly opposite relationships between bank prices and profits, on the one hand, and bank concentration, on the other. The structure-conduct view equates concentration with lack of competition, so all else equal, concentration should be associated with lower deposit rates, less efficiency, and higher profits. The conduct-structure view equates concentration with greater efficiency, so concentration should be associated with higher deposit rates and greater efficiency in more concentrated markets.

Studies of the banking industry largely support the structure-conduct view. In fact, banks in more concentrated markets pay lower deposit rates (Berger 1995; Berger and Hannan 1989), charge higher loan rates (Hannan 1991), and are less efficient (Berger and Hannan 1998).<sup>7</sup> In view of this evidence, and following most of the related literature, this article uses higher concentration as a proxy for lower competition, rather than greater efficiency.

## 4. BRANCH PRICE DATA AND THEIR RELATION TO STATE AND LOCAL CONCENTRATION

Our sample comprises 110 branch sales between 1992 and 1999 in ten northeastern states: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, and Vermont. The branch sale data were obtained from SNL Financial. The SNL Financial deal data were matched with branch-level Summary of Deposits data collected by the Federal Deposit Insurance Corporation. We found complete matches for 111 of the initial 220 deals obtained from the SNL Financial data. Our small data set makes some results sensitive to how we treat the data, as we discuss below.

The distribution of deals across years and states is reported in Table 2. Sixty-nine deals occurred in New York, New Jersey, and Pennsylvania. The number of deals picked up substantially after 1993—the year before passage of the Riegle-Neal

<sup>7</sup>Significantly, Berger and Hannan (1998) allow for the possibility that efficiency differences could cause differences in concentration by using two-state least squares (using population as an instrument for concentration). Their finding that concentration reduces efficiency helps explain why banks in more concentrated markets do not earn substantially higher profits, even though they charge higher loan rates and pay lower deposit rates; bank managers may sacrifice higher profits in exchange for a “quiet life.”

TABLE 2

### Distribution of Bank Branch Sales in Northeastern States, 1992-99

Year	Number of Deals	Mean Branches	Standard Deviation	Minimum Branches	Maximum Branches
1992	4	1.00	0.00	1	1
1993	1	1.00	—	1	1
1994	15	1.93	1.75	1	7
1995	38	3.61	4.10	1	20
1996	13	3.54	5.17	1	20
1997	11	4.36	4.88	1	16
1998	15	2.67	2.77	1	10
1999	14	4.43	7.02	1	28
State	Number of Deals	Mean Branches	Standard Deviation	Minimum Branches	Maximum Branches
Connecticut	8	5.25	6.32	1	20
Delaware	2	4.50	4.95	1	8
Maine	5	2.20	1.64	1	4
Maryland	10	2.40	2.27	1	7
Massachusetts	12	4.92	6.23	1	20
New Hampshire	1	3.00	0.00	3	3
New Jersey	14	3.00	2.54	1	11
New York	24	3.92	5.90	1	28
Pennsylvania	31	2.13	2.74	1	16
Vermont	4	4.25	3.30	1	8
Total	111	3.31	4.34	1	28

Source: Authors' calculations.

Interstate Banking and Branching Efficiency Act. The average branch sale involved 3.3 branches, with a range of 1 to 28. About half (55) the deals involved just a single branch. Average deposits across deals were \$122.5 million.

Table 3 reports summary statistics on branch prices. The pricing of a branch deal requires some explanation. In most deals, the buyer acquires the physical assets, such as premises, and assumes the deposit liabilities (Berkovec, Mingo, and Zhang 1997).<sup>8</sup> Deposit liabilities usually exceed assets, so the difference represents the “price” paid by the buyer, even if no money changes hands. The price is usually expressed as a premium per deposit. For example, if a bank buys a branch with assets worth \$75 and deposits of \$100, the premium per deposit is 4 (25/100). The average premium per deposit in this sample ranged from 0 to 21.9, with an average of 6.56.

The reasons for selling a branch are varied. Some sellers may need to raise capital or be rid of far-off, hard-to-manage branches. Other sellers may unload branches to reduce their market share

<sup>8</sup>The branch seller may include loans in the deal if there are no nearby loan-servicing facilities, but buyers often choose not to purchase loans because of uncertainty about their quality (Benz 1998, p. 33).

TABLE 3

### Summary Statistics on Branch Sales and Bank Concentration

Variable	Mean	Standard Deviation	Minimum	Maximum
Premium-deposit ratio	6.52	3.91	0	21.88
Deposits (thousands of dollars)	122.54	2,589.86	2.2	1,600
Log (deposits)	3.59	1.47	.79	7.38
Branches	3.31	4.34	1	28
Log (branches)	0.73	0.87	0	3.33
Dow Jones Bank Index (percentage change)	0.00	0.60	-5.76	-0.44
Bank concentration				
Market HHI <sup>a</sup>	355	598	18	5,137
State HHI	667	221	382	1,790

Source: Authors' calculations.

Notes: HHI, the Herfindahl-Hirschman Index, measures deposit market concentration.  $HHI = \sum_i (S_i)^2$ , where  $S_i$  = share of market (or state) bank deposits at bank  $i$ .

<sup>a</sup>Market is defined by each Federal Reserve Bank.

before merging with another bank in that market; by selling branches before applying to merge, banks can avoid a forced divestiture of branches as a condition of merger approval.

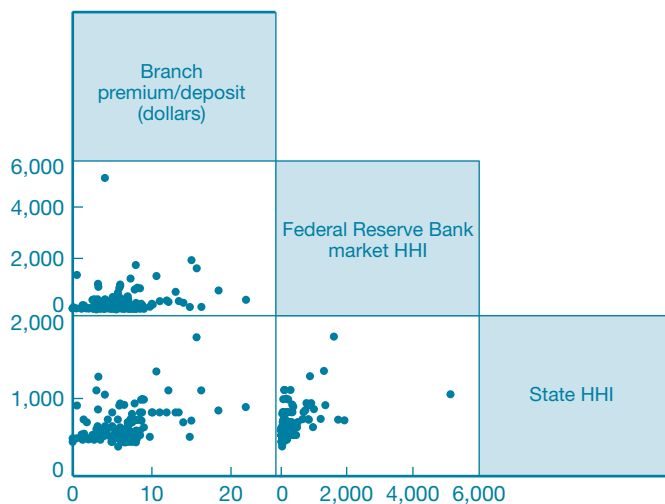
Table 3 also reports statistics on bank concentration (HHI) at both the state and market levels at the date of the deal. The state HHI is measured precisely for all deals. The market HHI is measured precisely for single branch deals and for multiple branch deals when all branches are located in the same market, but for multimarket deals, “the market HHI” is actually the weighted average of the HHI across the markets where the branches in the deal are located. The HHI in each market is weighted by the share of total deal deposits located at branches in each market.<sup>9</sup> Averaging causes some error in the market HHI measurement, but probably not much; there were only twenty-three multimarket deals, and sixteen of them involved just two markets (six deals involved three markets and one deal involved four markets).

Chart 1 presents a scatterplot of the prices for each branch deal against the corresponding state HHI and market HHI. Note the outlier in the branch premium–market HHI plot; as we will see, the relationship between branch prices and market HHI depends on whether we include that observation.

<sup>9</sup>For example, if 25 percent of the deposits in a deal were at branches in a market with an HHI of 1,000 and 75 percent were at branches in a market with an HHI of 2,000, the weighted HHI for the deal would be 1,750.

CHART 1

Branch Price versus Federal Reserve Bank Market HHI and State HHI



Sources: SNL Financial (branch premia); authors' calculations (HHI).

Notes: HHI, the Herfindahl-Hirschman Index, measures deposit market concentration. The lower-right panel shows the relationship between state HHI and market HHI.

Chart 2 plots average branch prices and HHI—market and state—for deals occurring each year. All three trends are upward. The upward trend in concentration reflects the merger wave over the 1990s.

According to Benz (1998, p.33), the deposit premium depends on “the relative attractiveness of the *market area* and earnings potential” (emphasis added). Market attractiveness, in turn, should depend on concentration: all else equal, a branch in more concentrated markets should have higher earnings and thus a higher premium.

To test which measure of concentration matters most in explaining branch price, we regress branch prices on market HHI, state HHI, and a short set of control variables

$$price/deposit = \alpha + \gamma market\ HHI + \beta state\ HHI + \chi controls + \epsilon.$$

The local-market hypothesis implies a positive coefficient on market HHI and a zero coefficient on state HHI:  $\gamma > 0$ ,  $\beta = 0$ . The state-market hypothesis implies the opposite:  $\gamma = 0$ ,  $\beta > 0$ .

Our control set is limited by our small sample. Branch prices should depend on overall banking profitability, so we include the average monthly return on the Dow Jones Bank Stock Index (*DJBANK<sub>t</sub>*). Larger branches may fetch higher prices

because of economies of scale, so we include the deal deposits, measured in log units (*log deposits*).

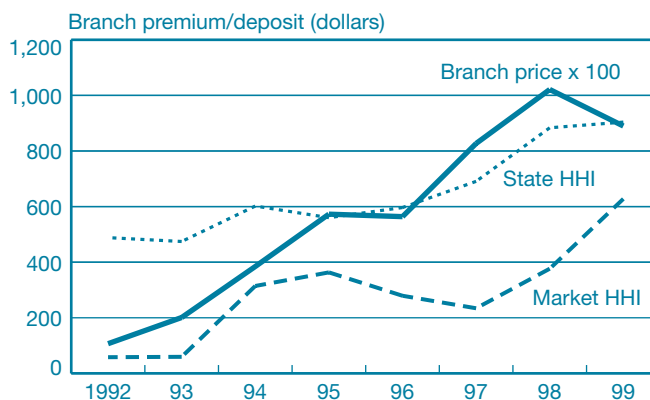
In some regressions, we control for the state where the branches were located and/or the year the branches were sold. The state indicators account for fixed differences between states in the average branch premium. Controlling for the state amounts to subtracting the mean of each variable (over time) from every observation on that variable. Controlling for the year amounts to subtracting the mean of each variable (over states) from each observation of that variable. With the “demeaned” variables, the regressions estimate how deviations from average in the branch premium within a given state or year (or both) are related to deviations from average in each HHI within the same state or year (or both).

Table 4 reports the regression results. Both HHIs were divided by 100 to avoid reporting many zeros. Regressions 1-4 include market HHI, but not state HHI. The coefficient on market HHI is significant at the 1 percent to 5 percent level for every regression (1-4). Regressions 5-8 include state HHI, but not market HHI. In the regressions without year controls (5-6), the coefficient on market HHI is significant at the 1 percent level. The  $R^2$  for those regressions is 23 percent to 29 percent higher than it is for the corresponding regressions with just market HHI (1-2). Looking across all years, in other words, one sees that branch prices depend more on the state HHI than on the market HHI.

In the regressions *with* year controls (7-8), state HHI is insignificant. The  $R^2$  for those regressions is lower than it is for the corresponding regressions with just market HHI (1-2), but

CHART 2

Average Branch Prices and HHI Each Year



Sources: SNL Financial (branch premia); authors' calculations (HHI).

Note: HHI, the Herfindahl-Hirschman Index, measures deposit market concentration.

TABLE 4

## Do Branch Prices Depend on Concentration (HHI) at the Local Market Level or at the State Level?

	1	2	3	4	5	6	7	8	9	10	11	12
Constant	-8.43*** (2.81)	-13.15*** (3.32)	-11.21*** (2.38)	-13.48*** (2.73)	-10.91*** (2.52)	-17.57*** (2.93)	-11.63*** (2.42)	-5.87** (2.88)	-2.20* (1.16)	-8.84*** (2.09)	-1.99 (1.25)	-16.38*** (25.63)
Market HHI/100	0.25*** (0.09)	0.33*** (0.12)	0.16* (0.09)	0.26** (0.11)					0.06 (0.13)	0.20 (0.13)	0.17 (0.11)	0.28** (0.12)
State HHI/100					0.67*** (0.13)	1.23*** (0.24)	0.17 (0.14)	0.65 (0.42)	0.62*** (0.17)	1.14*** (0.24)	-0.01 (0.19)	0.62 (0.39)
Log deposits	1.35*** (0.27)	1.61*** (0.27)	1.33*** (0.23)	1.44*** (0.23)	1.23*** (0.24)	1.31*** (0.22)	1.29*** (0.24)	1.38*** (0.24)	1.24*** (0.24)	1.32*** (0.21)	1.33*** (0.24)	1.39*** (0.23)
Bank stock index	69.90***	37.97*	30.81	27.64	71.53***	39.47	32.3	32.3	70.46***	38.87	30.73	29.69
Percentage change	23.75	21.88	26.71	25.05	22.37	24.75	27.81	27.91	22.69	24.06	26.69	3.52
State controls?	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Year controls?	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
Number of observations	110	110	110	110	110	110	110	110	110	110	110	110
R <sup>2</sup>	0.35	0.45	0.60	0.65	0.43	0.58	0.58	0.63	0.43	0.60	0.60	0.66

Source: Authors' calculations.

Note: HHI, the Herfindahl-Hirschman Index, measures deposit market concentration.

\*Statistically significant at the 10 percent level.

\*\*Statistically significant at the 5 percent level.

\*\*\*Statistically significant at the 1 percent level.

the difference in R<sup>2</sup> is very small. Within a given year, in other words, it does not matter much whether one looks at market HHI or state HHI.

The final regressions, 9-12, include both market HHI and state HHI. Without year controls (9-10), the state HHI coefficient is significant at the 1 percent level, but the market HHI coefficient is insignificant. The (adjusted) R<sup>2</sup> for regressions 9 and 10 is barely different from that for the corresponding regressions (5-6) with state HHI by itself. Given state HHI, in other words, market HHI has very little marginal explanatory value for branch prices.

In the regressions *with* year controls (11-12), state HHI is insignificant. Market HHI is also insignificant in the regression without state controls (12), but is significant in the regression with year *and* state controls (11). State HHI is insignificant within a given year partly because our sample comprises only eight years; limited variation in state HHI across states makes the relationship between state HHI and branch prices hard to

estimate precisely (hence the higher standard errors of the within-year estimates). Controlling for the year does not handicap market HHI so much because we have sixty-six markets in our sample. We suspect that the dominance of market HHI over state HHI in explaining variation in branch prices within a year mostly reflects the fact that our small sample is spread more widely across markets than across states. It will take more data to verify that conjecture, however. With a bigger data set, we would control for year, state, *and* market.

More data would also help with the outlier observation on market HHI (Chart 1) that we exclude from the regressions. With that outlier included, market HHI is never significant (in any regression), but state HHI remains significant.

Which HHI—state or market—matters most in dollar terms? The market HHI coefficient (when significant) ranges from 0.16 to 0.33, with a midpoint of 0.25. The state HHI coefficient (when significant) ranges from 0.62 to 1.14, with a midpoint of 0.88. The state HHI coefficient estimate

is 3.5 times larger than the market HHI coefficient, but then again, market HHI varies more than state HHI (Table 1). The standard deviation in market HHI is only about 2.7 times larger than the standard deviation in state HHI, however, so in the end, state HHI matters more for branch prices: the branch premium per deposit increases by 1.95 per one-standard-deviation increase in state HHI ( $222 \times 0.0088$ ). The average premium per deposit is 6.5, so an increase of 1.95 is large. By contrast, the premium per deposit increases by just 1.5 per one-standard-deviation increase in market HHI.

## 5. ROBUSTNESS AND CAVEATS

### 5.1 Divestiture?

Our source for branch price data, SNL Financial, does not identify which deals, if any, were divestitures pursuant to a merger.<sup>10</sup> The forced nature of divestitures is potentially problematic: divestitures occur in more concentrated markets, so if divested branches sell for less, our estimate of the price-market concentration relationship might be biased downward. Prices on divested branches are determined through competitive bidding, however, so sellers should not necessarily have to sell at a discount. We also analyzed whether the particular markets covered in our sample were more concentrated than the average market in northeastern states (implying that divestitures might be more likely in our sample), but found that they were not.

### 5.2 Similar Results for Single-Branch Deals

Recall that for multibranch deals, market HHI is the weighted average of the HHI across the markets involved. By contrast, none of the deals in our sample covers multiple states, so state HHI is not an average.

Does averaging the HHI across markets cause errors in market HHI that make state HHI look more important by comparison? No. Regressions with just the set of fifty-four single-branch deals are very similar to regressions using multibranch deals as well. The relative size and significance on market HHI and state HHI are about the same as they are in regressions 9-12 in Table 4; only state HHI is significant in the models without year effects (analogous to 9 and 10), but only market HHI is significant with year effects.

<sup>10</sup>Regulators may require the merging banks to reduce their market share by selling off branches.

### 5.3 No Controls for Branch Efficiency

A potential problem arises from the fact that our regressions do not control for differences in branch efficiency. More efficient branches will certainly sell for higher prices, and branch efficiency might be correlated with market (or state) concentration as the better branches wind up dominating the market. Thus, the positive correlation between branch prices and concentration (market or state) *might* really reflect an omitted third variable—efficiency—that is positively correlated with both branch prices and concentration.<sup>11</sup>

Controlling directly for branch efficiency would be the natural way to rule out this alternative interpretation of our findings, but compiling branch-level efficiency measures would be prohibitive. As a shortcut, we did control for the number of years since a state relaxed branch restrictions as a (statewide) proxy for branch efficiency.<sup>12</sup> Including years since deregulation as an additional control variable did not alter the relative importance of market HHI and state HHI in explaining branch prices.

## 6. CONCLUSION

Are banking markets local or statewide? We do not settle the question here, but we advance it with a new, arguably better, indicator of market size: bank branch prices. Some of our regression results are consistent with the hypothesis of statewide banking markets. Across all years in our sample—1992-99—branch prices are more closely correlated with bank concentration at the state level than at the designated market level. State-level concentration also tends to matter more for branch prices in dollars and cents, not just in statistical terms.

Some caveats are in order, however. First, our data cover only branch sales in northeastern states. Whether our results apply to the rest of the country is another question. Second, the relationship between branch prices and state concentration for northeastern states is significant across years but not within years. The insignificant relationship within years may stem from our small data set of just ten states, but it might also mean that the relationship between branch prices and state

<sup>11</sup>It is not obvious, however, that omitting branch efficiency leads to bias that favors state HHI over market HHI. Also, observe that this alternative interpretation is more in line with the performance-structure view discussed earlier, wherein differences in firm performance lead to differences in market structure. Our analysis is more in line with the structure-performance paradigm, wherein differences in market structure dictate firm performance. Recall also that the balance of evidence supports the structure-performance paradigm, wherein differences in concentration across markets reflect differences in competition (not efficiency).

<sup>12</sup>See Strahan (forthcoming) for a review of his findings on the efficiency gains associated with branching deregulations.



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concentration across years is spurious. We cannot say for sure without more data.

Going forward, other researchers might wish to consider studying branch prices over all states. With branch price data covering the entire country, we might settle the “local or state?”

debate once and for all. Of course, it may not be just one or the other; markets in the northeast may be larger than those in other parts of the country. Either way, it is important to banking consumers to get the markets right.

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