

# Banking Consolidation and Correspondent Banking

by William P. Osterberg and James B. Thomson

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## Introduction

Throughout most of the United States' financial history, correspondent banking has been an underpinning of our banking system. Banks use correspondent banking relationships to deliver services to customers in markets where the bank has no physical presence. For example, international correspondent banking relationships are used by large banks seeking to provide services to multinational corporations and in the finance of foreign trade. Due in part to the historical limitations on geographic expansion by banks, correspondent banking has been an important channel for delivering services to domestic customers who may be operating in markets beyond the bank's geographic reach. Correspondent banking markets often allow banks to purchase intermediate goods and services at a lower cost than producing them in-house—hence these markets may have been critical to the success of community banks.

The ongoing consolidation of the U.S. banking system and the increasing geographic scope of large banking institutions could have important implications for the competitive structure and, in turn, the efficiency of correspondent banking markets. Whether these

changes will lead to more or less competition in correspondent banking is unclear. On one hand, consolidation will inevitably lead to a reduction in the number of banks offering correspondent banking services, thereby increasing the market power of the remaining players. On the other hand, given that correspondent banking markets' services are regionally or locally based, interstate consolidation may increase the number of providers in a local market—even though the total number of suppliers has been reduced nationally. Finally, the shrinking number and increased average size of banks may lead to a reduction in the demand for correspondent banking services.

Banking industry consolidation could have important implications for the Federal Reserve Banks in their traditional role as providers of correspondent banking services. As banking becomes less fragmented and more nationally integrated, there is less need for the public correspondent banking network operated by the Federal Reserve Banks. However, if banking consolidation appears to have materially diminished the competitiveness of private correspondent banking markets, then the continued role of Federal Reserve Banks as public competitors may be warranted.

TABLE 1

FDIC-Insured Commercial Banks<sup>a</sup>

Bank size	Number of banks	Total assets <sup>b</sup>
Less than \$25 million	1,370	22,496
\$25 to \$50 million	2,026	75,077
\$50 to \$100 million	2,251	161,502
\$100 to \$300 million	2,259	371,720
\$300 to \$500 million	400	152,924
\$500 to \$1 billion	304	209,387
\$1 to \$3 billion	206	332,204
\$3 to \$10 billion	104	596,790
\$10 billion or more	64	3,260,657
Total institutions	8,984	5,182,759

a. As of June 30, 1988.

b. In millions of dollars

SOURCE: Federal Deposit Insurance Corporation, *Statistics on Banking* (<http://www.fdic.gov/databank/sob/>).

In this article we reexamine some of these issues, focusing on the impact of regulatory changes to permit intrastate branching and interstate banking. Our concern is primarily with the impact of such changes on concentration in correspondent balances and domestic deposit markets. We utilize the call report data compiled by the Federal Financial Institutions Examinations Council (FFIEC) and the *Summary of Deposits* data prepared by the Federal Deposit Insurance Corporation (FDIC). Any changes in concentration could have important implications for the efficiency and competitiveness of banking markets.

The paper is organized as follows: Section I provides an overview of correspondent banking. The correspondent banking literature is reviewed in section II. Section III furnishes a description of the data and the empirical strategy. The results are discussed in section IV. Finally, conclusions and recommendations are presented in section V.

## I. An Overview of Correspondent Banking

All firms face the fundamental decision of whether to make or buy a particular input used in production. For example, an automobile manufacturer must decide whether to make its own engines and transmissions or to buy them from an outside supplier. Computer manufacturers must decide whether to make or buy the processors used in their machines. Likewise, a bank must decide whether to sort and present

for collection checks drawn on other banks that have been deposited in customer accounts, or to contract with a third party to perform this function. For firms, the make-or-buy decision depends on a number of factors, including the nature of the input's production function, the firm's demand for the good relative to the market, and the competitive structures of the market for the input good and the market for the final good.

Banking literature refers to correspondent banking as the purchase (by banks) of input from other banks, central banks, and bank clearinghouses. For instance, when a bank in Cleveland sends checks to its local Federal Reserve Bank for collection, it has purchased correspondent banking services from that Reserve Bank. Another example is a recent agreement between J. P. Morgan and Chase Manhattan Bank, in which Chase provides European currency clearing services for Morgan.<sup>1</sup> The main services provided by correspondent banks are discussed in section II and in the appendix.

Correspondent banking relationships are relevant to the cost structure of the U.S. depository institutions sector. As table 1 shows, the legacy of our unit-banking system—a consequence of intrastate and interstate branching restrictions—is a highly fragmented banking system with a large number of small, locally and regionally based institutions. Economies of scale in the production of inputs associated with the provision of many types of bank services, especially payments services, exceed the range of output for most community banks.<sup>2</sup> Furthermore, community banks lack the geographic scope needed to capitalize on network externalities. Hence, in the absence of correspondent banking markets, community banks would likely be less efficient providers of financial services and would have more difficulty surviving in increasingly competitive banking markets.

In a typical correspondent banking relationship, the supplier of services is another bank. The provider of services in the input market can be viewed as a vertically integrated firm that may compete with the community bank in the output market. For the integrated firm, the benefits of supplying correspondent banking services are clear. First, there are economies of scope between production of input for its own products and production of correspondent banking products. Second, providing correspondent banking services may allow the integrated

■ 1 See Steven Marjanovic, "Morgan Taps Rival Chase for Europe Clearances," *The American Banker*, August 11, 1998, p. 1.

■ 2 See Bauer and Ferrier (1996).

bank to more fully exploit economies of scale or network effects. This, in turn, lowers the cost of producing (or increases the demand for) its own downstream products.

The competitive structure of the correspondent banking market may also be relevant to the structure of the markets for bank products. Industrial organization theory tells us that if the integrated firm has substantial monopoly power in the upstream (input) market, then it may use that power to damage its rival in the downstream market.<sup>3</sup> Thus, if the supplier of correspondent banking services competes with its customer (the community bank) in the output market, then it may price its services above the average cost of production—thereby damaging the community bank’s ability to compete. The integrated bank’s ability to do this depends on the competitive structure of the upstream and downstream markets.

## II. Literature Review

A correspondent banking relationship involves a correspondent bank, which provides the services, and a respondent bank receiving them. The respondent usually pays for the services by maintaining correspondent balances at the larger bank. The mix of services that might be provided is broad, but appears to emphasize check processing, especially for smaller banks, and loan participation. Other services include providing reports on economic conditions, making securities recommendations, and safe-keeping securities. Correspondents also have made markets for federal funds, in effect reducing the minimum size of such transactions.<sup>4</sup>

Correspondent services are not paid for directly with fees, but rather implicitly through maintaining deposit balances.<sup>5</sup> Some critics have claimed that greater efficiency would result from direct payment and have implied that smaller banks might not always have known the true cost of the services.<sup>6</sup> Banks, however, historically have opposed the introduction of direct fees.

The early literature on correspondent banking appears to have grown in response to two developments: One was the decline in Federal Reserve membership, which led to the establishment of regional Federal Reserve check processing centers in the early 1970s and the passage of the Depository Institutions Deregulation and Monetary Control Act of 1980. The other was the prospect of increased merger activity in banking, rationalized by a purported positive impact on banking efficiency. Early research

explored whether correspondent banking allowed smaller banks to gain access, or gain access at a lower cost, to some of the services that might be provided through mergers or acquisitions. This would imply, for example, that correspondent relationships provided alternatives to mergers permitted by interstate banking, and that the correspondent system might be affected by such developments. Another closely related issue was economies of scale in the production of important banking services. Certain services, such as processing of international financial transactions or specialized loan programs, were more likely than others to be provided at a lower cost by larger banks. An issue related to the impact of mergers on efficiency was whether holding-company affiliation might allow smaller banks to gain access to economies of scale in certain services provided by the lead bank, which is presumably larger. The argument had been made that allowing small banks to join holding companies would allow them to reduce the number of correspondent accounts—and the total amount of interbank balances held—but maintain the same level of correspondent services. However, evidence as early as 1970 showed that, contrary to this argument, the average size of interbank accounts appeared the same for smaller banks in or out of holding companies. This suggested that holding-company affiliation did not provide small banks with meaningful opportunities to economize on holdings of interbank balances.<sup>7</sup> Another alleged advantage of holding-company affiliation was the increased ease of getting loan participations. While some evidence in favor of this was found, the related claim that banks facing funding or capital constraints would have an easier time placing loan participations with their respondents (that is, the banks purchasing correspondent services) could not be supported.

■ 3 See McAfee (this issue) for a discussion of the damage-your-rival argument and a counterexample.

■ 4 Knight (1970a) reported that about 90 percent of the banks surveyed indicated that their correspondents offered to help with international banking services, collections, bank wire, and advice on consumer credit, credit information, and electronic data processing.

■ 5 Implicitly, as was pointed out by Flannery (1983), the correspondent should provide services costing  $[1 - \rho]r$ , where  $\rho$  is the reserve requirement and  $r$  is the market interest rate.

■ 6 Although fees are not charged directly for correspondent services, detailed account analyses were performed to estimate the revenue and expenses from correspondent accounts (see Knight [1970a]).

■ 7 See Knight (1970a, 1970b).

We are not aware of any studies that directly tackle the question of whether efficiency is enhanced by the presence of a correspondent banking network. A few studies take an indirect look at efficiency by analyzing overall economies of scale for banks, taking account of the provision of correspondent banking services—something that previous work on economies of scale using functional cost analysis (FCA) data failed to control for. Dunham (1981) found that after controlling for the provision of correspondent banking services, noncorrespondent banking services exhibited economies of scale in production—something that previous studies were unable to find. This could be the result of two factors: First, if small banks trade relatively more correspondent balances for services (with such payments not reflected in the FCA data), they would appear more efficient. Second, larger banks producing more “due to” accounts, which are more service-intensive, would appear to have higher costs.

Flannery (1983) also re-estimated bank cost functions after adjusting for the understatement the cost to the bank purchasing correspondent services. He found that branch bank scale economies were overestimated, but those of unit banks were not affected. Gilbert (1983) found economies of scale in the provision of correspondent services, which he claims were due to an inverse relation between the amount of demand balances due to banks and their short-run variability.

Prior to the move toward interstate banking, it was already apparent that correspondent banking might allow smaller banks to overcome the obstacles to geographic diversification posed by interstate banking restrictions. One possibility is that correspondent banking would help effect a transfer of funds from surplus to deficit areas. Loan participations are a major vehicle for this. Funds are transferred from the larger correspondent bank to a smaller respondent bank to meet a loan request that either exceeds funds available through local deposits or exceeds legal lending limits. Payment for such correspondent services is made in terms of the respondent’s balances at the correspondent bank. Knight (1970b) presents evidence supporting the hypothesis that correspondent banking provides a channel for funds to flow from surplus to deficit areas. This author documents a large net flow of funds to correspondents, even from respondent banks that originated loan participations. The appendix provides further detail on this branch of the literature.

The possibility that correspondent banking might affect the competitiveness of downstream markets was recognized early on. Consistent with occasional concerns that correspondents might steal business from their respondents, Knight (1970a) indicates that money market correspondents would participate only if the originating bank would reciprocate in participations. Anecdotal evidence suggests that some correspondents had stated the view that borrowers consistently unable to obtain loans from the respondent should switch to the correspondent for lending.

Early work presaged a concern over the impact of regulatory policies on the correspondent banking system. Obviously, any regulatory change that influenced correspondent services, such as check-clearing arrangements, might have a direct effect on the use of private correspondents for such services. Knight (1972) focuses on the impact of the Federal Reserve System’s development of regional check processing centers (RCPCs) and the change in Regulation J requiring all banks to pay for cash letters received from Federal Reserve Banks on the day of receipt in immediately available funds. The creation of the RCPCs was seemingly intended to improve the efficiency of the check-clearing mechanism by permitting all participating banks to route items drawn on other participating banks to the clearing center on the day of the deposit. The Regulation J change may have had the effect of transferring collected funds from outlying (rural) banks (which had been granted a delay in paying after receipt of a cash letter) to city banks. For Federal Reserve member banks this regulatory change effectively reduced the burden of reserve requirements. However, during this time in most states, nonmember banks could count correspondent balances toward reserve requirements set by their state banking regulatory agency. Therefore, a differential impact might have been felt by outlying nonmember banks since they would not have had the advantage of reduced reserve requirements.

Other Federal Reserve System policies have had key regulatory influences on the development of the correspondent banking system. Kane (1982) discusses Title I of the Depository Institutions Deregulation and Monetary Control Act of 1980 (DIDMC), which mandated that the Fed make its correspondent services available to all depository institutions and that they be explicitly priced. Historically, the Fed had offered correspondent services to members free of charge, in part to offset costs associated with then-higher reserve requirements faced by

TABLE 2

## State Branching Status

State	Current status <sup>a</sup>	Year switched to limited branching	Year switched to statewide branching	Effective date for interstate banking	State	Current status <sup>a</sup>	Year switched to limited branching	Year switched to statewide branching	Effective date for interstate banking
Alabama	Statewide		1987	5/31/97	Nebraska	Limited			5/31/97
Alaska	Statewide			1/1/94	Nevada	Statewide			9/28/95
Arizona	Statewide			8/31/96	New Hampshire	Statewide			6/1/97
Arkansas	Limited			5/31/97	New Jersey	Statewide			4/17/96
California	Statewide			10/2/95	New Mexico	Statewide	1991		6/1/96
Colorado	Limited	1991		6/0/97	New York	Statewide			2/6/96
Connecticut	Statewide			6/27/95	North Carolina	Statewide			6/22/95
Delaware	Statewide			9/29/95	North Dakota	Limited	1991		5/31/97
District of Columbia	Statewide			6/13/96	Ohio	Statewide		1990	5/21/97
Florida	Statewide			5/31/97	Oklahoma	Statewide		1993	5/31/97
Georgia	Limited			6/1/97	Oregon	Statewide			2/27/95
Hawaii	Statewide			6/1/97	Pennsylvania	Statewide		1990	7/6/95
Idaho	Statewide			7/1/95	Rhode Island	Statewide			6/20/95
Illinois	Statewide	1988	1994	6/1/97	South Carolina	Statewide			7/1/96
Indiana	Statewide		1991	3/15/96	South Dakota	Statewide			7/1/96
Iowa	Limited			6/1/97	Tennessee	Statewide		1990	6/1/97
Kansas	Statewide	1988	1990	6/1/97	Texas	Statewide		1990	8/28/95
Kentucky	Limited			6/1/97	Utah	Statewide			6/1/95
Louisiana	Statewide		1990	6/1/97	Vermont	Statewide			5/30/96
Maine	Statewide			1/1/97	Virginia	Statewide			7/1/95
Maryland	Statewide			9/29/95	Washington	Statewide			6/6/96
Massachusetts	Statewide			8/2/96	West Virginia	Statewide		1988	5/31/97
Michigan	Statewide		1987	11/29/95	Wisconsin	Statewide		1990	6/1/97
Minnesota	Limited			6/1/97	Wyoming	Limited	1991		5/31/97
Mississippi	Statewide		1990	5/1/97					
Missouri	Statewide	1987	1991	6/1/97					
Montana	Limited	1990		3/21/97					

a. As of June 30, 1996.

SOURCE: Federal Deposit Insurance Corporation, Annual Reports (various).

member banks. Rising interest rates increased the opportunity cost of holding reserves. Hence, rising interest rates during the 1970s would have increased the cost of Fed membership, and the ability of banks to leave the System may have increased pressure on the Fed to offer additional services. These included access to the discount window and the hope of receiving preferential regulatory treatment.<sup>8</sup> Other aspects of Federal Reserve membership and relevant regulation are discussed in the appendix.

### III. Framework for Analysis and Data

Data limitations constrain our choice of an analytical framework likely to have empirical applicability. Many of the studies cited above utilize data generated by one-time surveys of specific geographical regions. “Due to” and “due from” balances, corresponding to the lia-

bility and assets entries for the deposits of the respondent with the correspondent, respectively, are provided on the FFIEC’s call report forms. However, these reports do not allow us to match up the two banks. In addition, the due-to numbers are not available for small banks. Aside from information about organizational structure, location, and mergers and acquisition history, few of the variables analyzed in the studies cited previously are available in regular reports. Our approach here focuses on the correspondent balance numbers and the data on overall domestic deposits. Supplemental data on deposit markets is constructed using the FDIC’s *Summary of Deposits* data, which are available on an annual basis.

■ 8 In Kane’s analysis, the fact that private correspondents offer a wider array of services implies that the balance requirements set by them exceed the Fed’s reserve requirements on the same balances.

TABLE 3

## Banks and Branches

Year	Banks	Branches	Offices
1966	13,529	16,842	30,371
1967	13,506	17,884	31,390
1968	13,479	18,966	32,445
1969	13,464	20,149	33,613
1970	13,502	21,597	35,099
1971	13,602	23,080	36,682
1972	13,721	24,566	38,287
1973	13,964	26,403	40,367
1974	14,218	28,384	42,602
1975	14,372	29,929	44,301
1976	14,397	31,068	45,465
1977	14,397	32,836	47,233
1978	14,378	34,524	48,902
1979	14,351	36,521	50,872
1980	14,421	38,458	52,879
1981	14,401	40,500	54,901
1982	14,435	39,485	53,920
1983	14,454	40,548	55,002
1984	14,483	41,485	55,968
1985	14,402	42,970	57,372
1986	14,193	44,054	58,247
1987	13,705	45,017	58,722
1988	13,119	46,036	59,155
1989	12,697	47,650	60,347
1990	12,329	50,017	62,346
1991	11,909	51,591	63,500
1992	11,449	51,544	62,993
1993	10,944	52,467	63,411
1994	10,431	54,656	65,087
1995	9,921	56,028	65,949
1996	9,511	57,258	66,769
1997	9,125	59,773	68,898

SOURCE: Federal Deposit Insurance Corporation, *Statistics on Banking* (<http://www.fdic.gov/databank/sob/>).

TABLE 4

National Correspondent  
Banking Deposit Shares

Year <sup>a</sup>	Market share (percent)		
	Top 50 banks	Top 10 banks	Top 5 banks
1984	28.18	11.92	7.51
1985	27.79	14.78	10.51
1986	26.89	11.87	8.07
1987	26.47	11.53	7.78
1988	25.53	10.94	7.05
1989	27.82	13.15	8.66
1990	29.79	12.99	8.64
1991	28.61	12.89	8.95
1992	29.43	12.38	7.76
1993	30.44	13.39	7.99
1994	32.64	13.33	8.40
1995	33.52	14.94	8.52
1996	36.57	16.07	9.99

a. As of June 30.

SOURCE: Authors' calculations.

The sample period studied here covers June 30, 1984, to June 30, 1996, and includes many shifts from unit banking to limited branching, and from limited branching to statewide branching. Table 2 details the history of such regulatory changes during our sample period.

While numerous analyses have focused on the issue of whether banking efficiency has been enhanced by the recent wave of mergers and acquisitions (M&As), the role of correspondent banking has been unclear. Ideally, our analysis of changing concentration in correspondent banking markets would take this factor into account. It is not possible, however, to directly examine the effect of M&As on efficiency using the existing data.

One possibility is that M&As would render unnecessary the pre-existing correspondent relationships involving the formerly independent banks. On the other hand, they could reduce the competitiveness and efficiency of the remaining system. Similar concerns arise with the changes in branching status that we identify. Branching economies might be affected. The presumption is that the largest bank is the correspondent. After the absorption of unit banks as branches of the new bank, the correspondent deposits no longer appear on the reports at the bank level upon which we focus.

Finally, data on market prices charged for private correspondent banking services do not exist, especially at the individual market level. Therefore, we rely on measures of market concentration, such as the Herfindahl index, to investigate the impact of branching deregulation on the structure of the interbank market. It is important to note, however, that market concentration measures are not always good proxies for the degree of competition in a market. Hence, increased concentration may not necessarily indicate a less competitive market—especially if the event driving market consolidation increases the degree of potential competition (contestability) in that market.

## IV. Results

Tables 3 and 4 illustrate the ongoing consolidation of the domestic commercial banking industry and its implications for the correspondent banking market nationwide. While the number of banks has fallen steadily from 1984 to 1996, the market share of the top 50 correspondent banks has risen from 28.18 percent to 36.57 percent of all deposits due to banks over the same time period. Similar results are found when looking at the market share held by the

TABLE 5

Deposits Due to Banks:  
State-Level Herfindahl

Year <sup>a</sup>	All states	Statewide branching	Limited branching	Unit banking
1984	1,302.32	1,814.80	730.67	987.02
1985	1,328.69	2,060.31	577.37	632.83
1986	1,315.64	1,989.67	632.66	746.03
1987	1,322.13	1,863.52	657.61	847.76
1988	1,467.51	1,861.73	804.60	1,646.37
1989	1,379.42	1,826.39	612.90	1,635.88
1990	1,416.91	1,549.98	803.99	2,271.65
1991	1,476.31	1,580.03	1,139.21	
1992	1,507.27	1,622.51	1,132.74	
1993	1,379.61	1,396.87	1,316.83	
1994	1,617.10	1,679.40	1,361.66	
1995	1,602.90	1,665.53	1,346.11	
1996	1,510.14	1,611.97	1,092.68	

a. As of June 30.

SOURCE: Authors' calculations.

TABLE 6

Deposits Due from Banks:  
State-Level Herfindahl

Year <sup>a</sup>	All states	Statewide branching	Limited branching	Unit banking
1984	2,121.30	3,084.66	1,210.53	1,160.00
1985	2,014.97	3,140.98	968.51	850.74
1986	2,240.79	3,561.01	1,021.35	858.86
1987	2,011.15	2,994.41	921.99	863.66
1988	1,854.20	2,714.22	895.89	488.00
1989	1,944.99	2,927.31	772.17	666.13
1990	2,176.47	2,794.63	699.32	787.21
1991	2,316.39	2,778.43	814.77	
1992	2,591.18	2,951.34	1420.68	
1993	2,708.97	3,186.43	972.77	
1994	2,700.65	3,141.37	893.69	
1995	3,022.00	3,486.61	1,117.09	
1996	2,984.88	3,307.98	1,660.20	

a. As of June 30.

SOURCE: Authors' calculations.

top 10 and top five correspondent banks nationwide. Despite the increased concentration of correspondent banking deposits shown in table 4, the national market for correspondent banking remains relatively unconcentrated, with no firm controlling more than 3.6 percent of deposits due to banks.

Unfortunately, most markets for correspondent banking services are likely to be local or

regional in scope and, therefore, national concentration measures may prove misleading. For example, if correspondent banking markets are effectively segmented by branching restrictions (intrastate or interstate), then low levels of market concentration at the national level may be consistent with highly concentrated markets at the state or local level. Moreover, to the extent that banking consolidation increases the contestability of correspondent banking markets, increases in market concentration at the national level may lead to more competitive correspondent banking markets at the state and local levels.

Data on correspondent banking markets are collected at the bank level, limiting our ability to accurately gauge the competitiveness of these markets. Moreover, the degree of aggregation in the data precludes us from looking at measures of concentration below the state level for both deposits due to banks (correspondent deposits) and deposits due from banks (respondent deposits).

To examine trends in market concentration at the state level, we construct Herfindahl indexes for deposits due to banks (correspondent deposits) and for deposits due from banks (respondent deposits). Tables 5 and 6 report the average Herfindahl for all states, states with statewide branching, states with limited branching, and unit banking states. Table 5 shows that correspondent banking is more concentrated, on average, in statewide branching states than it is in states with more restrictive branching laws. However, while mean concentration for the total of all states has risen over the sample period, holdings of correspondent deposits have become less concentrated in statewide branching states. The increasing mean concentration of correspondent deposits for all states over time likely reflects the ongoing consolidation of the banking system, especially in those states switching to less restrictive branching laws during the sample period. Moreover, the decline in the mean concentration of correspondent deposits for the statewide branching states over the sample period may simply reflect the inclusion of new states in the sample. If correspondent deposit markets in states that switched to statewide branching during the sample period are less concentrated than the average statewide branching state in the sample, then mean concentration for the sample should decrease over time.

Table 6 shows that respondent deposits (deposits due from banks) are also more concentrated in statewide branching states. To the extent that banking markets are more consolidated

TABLE 7

Domestic Deposits:  
State-Level Herfindahl

Year <sup>a</sup>	All states	Statewide branching	Limited branching	Unit banking
1984	803.57	1,413.75	245.13	155.41
1985	839.97	1,476.55	264.17	146.19
1986	829.74	1,434.67	290.64	152.30
1987	822.19	1,341.83	275.91	144.49
1988	874.87	1,363.18	305.17	191.21
1989	924.22	1,431.53	324.04	243.95
1990	948.53	1,216.49	310.75	284.19
1991	975.79	1,175.25	327.55	
1992	1,037.58	1,254.06	334.01	
1993	1,035.08	1,208.44	404.70	
1994	1,079.96	1,233.59	450.09	
1995	1,165.78	1,318.10	541.27	
1996	1,301.08	1,449.48	692.67	

a. As of June 30.

SOURCE: Authors' calculations.

TABLE 8

Domestic Deposits: Weighted  
Average Herfindahls for All Markets

Date	All states	Statewide branching	Limited branching	Unit banking
1984	2,269.58	2,502.29	2,309.44	1,379.66
1985	2,281.17	2,512.56	2,368.29	1,320.86
1986	1,886.94	1,983.10	2,288.14	1,337.33
1987	1,888.29	1,970.49	2,192.11	1,262.59
1988	2,451.90	2,597.36	2,231.45	1,750.54
1989	2,566.49	2,665.32	2,298.59	2,318.25
1990	2,674.95	2,786.77	1,850.64	2,046.39
1991	2,717.42	2,800.73	1,709.98	
1992	2,936.77	3,057.20	1,723.09	
1993	2,946.38	3,061.80	1,726.98	
1994	3,048.91	3,024.30	2,298.79	
1995	3,120.80	3,100.03	2,306.78	
1996	3,280.86	3,182.87	2,922.62	

a. As of June 30.

SOURCE: Authors' calculations.

in statewide branching states, one would expect to see fewer banks placing deposits with correspondent banks and, therefore, greater concentration. Unlike correspondent balances, however, respondent deposits do not clearly increase or decrease through time either for the full sample or for statewide branching states. Therefore, the implication of interstate branching on the concentration of respondent deposits is unclear.

The negative relationship between concentration in interbank deposit markets and the stringency of geographic limitations (that is, branching restrictions) may simply be a consequence of more concentrated deposit markets. That is, relaxation of branching restrictions may increase the concentration of banking deposits—a likely outcome of a more consolidated banking system—which, in turn, leads to more concentrated interbank-deposit markets. Tables 7 and 8 seem to bear this point out: Table 7 exhibits average Herfindahls at the state level for domestic deposits. Table 8 presents average market-level Herfindahls grouped by state branching status.<sup>9</sup> In both tables, statewide branching states tend to exhibit more deposit market concentration than other states, and the level of concentration has tended to increase over the sample period.

Simple correlation analysis confirms a high degree of correlation between interbank-deposit concentration and concentration measures of domestic deposit markets. The Spearman (Pearson) correlation coefficient between the state-level Herfindahl indexes for domestic deposits and correspondent deposits is 0.7033 (0.7153). The Spearman (Pearson) correlation coefficient between the state-level Herfindahl indexes for domestic deposits and respondent deposits is 0.7131 (0.6756). Moreover, the structure of the correspondent deposit market and the respondent deposit market are highly correlated with a Spearman (Pearson) correlation coefficient of 0.45665 (0.52298).

One problem with looking at time trends in Herfindahl indexes across states with different branching laws is that a number of states changed their laws during the sample period. This is evident from the disappearance of unit banking in the sample in 1991. All changes in branching status favored a less restrictive form of branching regulation. Therefore, a measure of caution is warranted when comparing trends in concentration across subcategories in tables 5 through 8.

Fortunately, we can directly test the impact of relaxing intrastate branching restrictions on deposit market concentration. For all states that changed branching status during the sample period (there were 22 such switches), we constructed state-level Herfindahls for domestic deposits, correspondent deposits, and respondent deposits two years prior to and two years

■ 9 In table 9, we assume that for bank offices located in MSAs the relevant market is the MSA. For bank offices located in non-MSA counties, the market is defined to be the county where the office is located.

TABLE 9

Event Analysis: Change  
in Branching Status

Variable	2 years prior to switch	2 years after switch	Change in Herfindahl	Percent change in Herfindahl
Domestic deposits	264.96	403.33	138.37 <sup>a</sup> 4.50	81.78 <sup>a</sup> 3.78
Deposits due from banks	789.67	791.48	1.82 0.02	1.42 0.17
Deposits due to banks	828.22	1436.55	608.32 <sup>a</sup> 3.17	144.26 <sup>a</sup> 3.27

a. Significant at the 1 percent level

SOURCE: Authors' calculations.

TABLE 10

## Regression Results

## Dependent Variable: HDEPIDOM

	Model 1	Model 2	Model 3	Model 4
Intercept	533.373 7.175	607.623 7.987	578.900 7.581	338.734 3.402
Timedum	-13.546 <sup>a</sup> -1.546 <sup>a</sup>	-6.202 <sup>b</sup> -0.698 <sup>b</sup>	-6.987 <sup>b</sup> -0.790 <sup>b</sup>	-12.697 <sup>b</sup> -1.424 <sup>b</sup>
HDOMDEP	1.022 26.267	1.114 24.510	1.028 18.796	0.949 16.730
DSBRANCH		-328.334 -3.839	-369.127 -4.277	-381.807 -4.457
HINTBDEP			0.061 2.815	0.070 3.160
HAVGDMKT				0.108 3.854
Adj-R <sup>2</sup>	0.512	0.522	0.527	0.527
F-Value	348.217	241.887	185.302	145.451
Prob >F	0	0	0	0

a. Significant at the 10 percent level.

b. Not significant.

NOTE: Unless otherwise noted, all coefficients are significant at the 1 percent level.

SOURCE: Authors' calculations.

after the event. We then tested to see if the change in the Herfindahls due to the change in branching status was significant. The results of the analysis are reported in table 9. For domestic deposits and correspondent deposits (deposits due to banks), a switch to more liberal branching significantly increases the Herfindahl; however, the change in the respondent

deposit (deposits due from banks) Herfindahl is not significant.

In all, univariate analysis of the data suggests that a relaxation of branching restrictions is associated with increased concentration in the market for domestic deposits and in the interbank deposit market. Neither of these results is surprising, as the removal of an artificial constraint to geographic consolidation of the banking system would be expected to increase concentration in banking markets. However, increased concentration does not necessarily translate into less competitive markets, as the removal of branching restrictions increases the potential for entry.

To separate the effects of branching status from deposit market concentration, we conduct a simple regression analysis—with the Herfindahl for correspondent deposits as the dependent variable. The results can be found in table 10. Model 1 regresses the correspondent deposit Herfindahl on the state-level Herfindahl for domestic deposits and a time dummy. Model 2 adds a statewide branching dummy variable (DSBRANCH = 1 for statewide branching, zero otherwise). A significant coefficient on DSBRANCH suggests that after controlling for the structure of the domestic deposit market, branching restrictions affect the structure of the correspondent banking market. Model 3 controls for the market concentration for respondent deposits. To the extent that there are scale and scope economies associated with the provision of correspondent banking services, increased concentration in respondent deposits may reduce the number of correspondent banks that can profitably operate in a market. Finally, model 4 extends the previous regression by including information on local market structure—HLOCDEP, the average local deposit market Herfindahl in each state. Inclusion of HLOCDEP allows us to control for the effect of local deposit market structure on correspondent banking.

The coefficient on the domestic deposit Herfindahl (HDOMDEP) is positive and significant from zero in all four models. In addition, the coefficient on the proxy for local deposit market structure (HLOCDEP) in model 4 is also positive and significant. This confirms the univariate results that find increased deposit market concentration associated with increased concentration in correspondent deposit markets. The negative and significant coefficient on DSBRANCH in models 2, 3, and 4 suggests that once domestic deposit market concentration is controlled for, relaxing branching restrictions leads to less concentrated and more

competitive correspondent banking markets. Finally, the positive and significant coefficient on the respondent deposit Herfindahl (HINTBDEP) index is consistent with the hypothesis that a reduction in the number of respondent banks reduces the number of correspondents that can coexist in a market—and hence increases concentration of correspondent deposits.

## V. Conclusion

Interstate branching promises to change the competitive landscape in banking. As illustrated by the mega-mergers of 1998—which included the merger of Bank of America and NationsBank—geographic consolidation of the banking system is well under way. This consolidation will certainly increase the concentration of deposit markets at the national and regional level. Moreover, the preceding analyses suggest that interstate consolidation may even increase deposit market concentration at the state and local level.

The evidence presented here indicates that intrastate branching deregulation and the subsequent geographic consolidation of the banking industry has led to increased concentration in the correspondent and respondent deposit markets. However, this increased concentration in the interbank market appears to be a consequence of increased concentration in the domestic deposit market associated with more liberal branching rights. Controlling for the level of concentration in the domestic deposit market, the effect of statewide branching is to reduce concentration in the correspondent deposit market. This result is consistent with the hypothesis that any positive effects of increased contestability of interbank markets resulting from the removal of branching restrictions mitigate (and may dominate) any negative effects on competition from increased concentration in interbank markets.

Overall, the evidence presented here suggests that interstate branching will result in more concentrated interbank markets, as the geographic consolidation of the banking industry at the national level will certainly reduce the number of correspondent and respondent banks nationwide. This increased concentration in correspondent banking markets will not necessarily reduce the competitiveness of these markets at the state and local level because branching deregulation also increases their contestability.

There are several caveats to these results: First, data limitations preclude our controlling

for important nonbank competitors in the correspondent banking market such as banker's banks, private clearinghouses, data processing firms, and the Federal Reserve Banks. Second, to the extent that banking organizations use the multibank holding company to circumvent branching restrictions, the measured impact of branching deregulation on market concentration and contestability will be overstated.

From a public-policy standpoint, if interstate branching leads to the establishment of truly national correspondent banks, then there may be less justification for the Federal Reserve System to provide correspondent banking services. However, more work needs to be done in this area before we can begin to seriously reconsider the role that Federal Reserve Banks play in this market.

## Appendix

### Loan Participations, Federal Reserve Membership, and Other Determinants of Correspondent Balances

Early literature indicates that loan participations are the second-most important service offered by correspondents. However, information about this activity is not available on the periodic reports submitted by banks. Knight (1970b) reports that 75 percent of banks experiencing an increased need for loan assistance cited the size of the loan as the main factor. The percentage of banks requiring loan assistance increased with bank size, and requirements for assistance are positively related to the loan-to-deposit ratio, the latter possibly indicating the importance of liquidity constraints. Knight (1970a) indicates that although most loan participations originate with the smaller banks, banks that do not experience excess loan demands can still buy loans or participations from their correspondents. Many respondents maintained credit lines or borrowed directly from their correspondents.

The correspondent services offered by the Federal Reserve System to its member banks have differed somewhat from those offered by private correspondents, and this has been a subject of contention and regulatory reform. Access to the discount window is probably the most obvious correspondent service that at some time might have been available only to members.

Federal Reserve membership has been identified as an important factor by several authors. The two reasons most often cited for nonmember banks being more likely to use correspondent services were the possibility that states with reserve requirements would allow nonmembers to count balances due as reserves, and the granting of immediate credit by correspondents for cash letters received from respondents. Lawrence and Lougee (1970) found that balances due from banks, but not the number of correspondent ties or their geographical distribution, is related to Fed membership. Member banks have higher balances due if balances at the Fed are included, but not if they are excluded. Knight (1970a) confirms this finding and also reports that the benefits of Fed membership appear to increase with bank size since, unlike overall banks, nonmember banks over a certain (small) size have correspondent balances that increase with bank size. Knight (1970a) reported that about 90 percent of banks surveyed preferred to send checks drawn on nonlocal banks through correspondents rather than the Fed, apparently because immediate credit was offered by the former. Although larger banks appear to have a greater preference for using the Fed, this could be misleading if correspondents send checks received from smaller banks on to the Fed for clearing.

Summers and Segala (1979) focus on the determinants of usage of Fed correspondent services. They find that bank size, holding-company affiliation, and metropolitan location increase the probability of a bank using Fed check-clearing services. However, only bank size affected usage of Fed wire services. Size is interpreted as indicating administrative capacity to manage the services.

Several other determinants of correspondent balances have been identified in the literature. For example, Lawrence and Lougee (1970) report that for banks in the Denver area, bank size, ratio of demand to total deposits, and distance of the bank from Denver are positively related to the amount of domestic "due from" balances. The number of correspondent ties is related to the first two characteristics. Meinster and Mohindru (1975) conclude that correspondent balances are influenced by liquidity considerations as well as the need to pay for correspondent services. The volatility of deposits is another factor: Kane (1982) found that suppliers of correspondent services imposed higher reserve requirements on more volatile deposits, a practice which is presumably consistent with volatility being related to the benefits derived from the services. Gilbert (1983) identifies a rela-

tionship between deposit volatility and the scale of correspondent services, with transaction cost being lowered by a larger number of respondents and thus a higher level of variability.

Geographic variables also play a role. Distance from the correspondent obviously is related to the cost of providing certain services, as well as familiarity with the correspondent. Size of city could, at times, be related to sophistication and consequently to the need for certain services.

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