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Financial analysis after the Riegle-Neal Interstate Banking and Branching Efficiency Act

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Abstract. A rapidly evolving structure of financial institutions throughout the United States has potential impacts on regional analysis. Important regional aspects of the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 are outlined along with theoretical propositions linked to credit, money, and regional depository institutions. Several cases are presented in which changes in financial institutions directly influence regional data and financial analysis. While the Riegle-Neal Act may yield significant efficiencies within the financial industry in general, it contributes directly to a loss of information about regional financial conditions; this represents a regional paradox in the information age.

1. Introduction

"The Congress finds that -

(1) Regulated financial institutions are required by law to demonstrate that their deposit facilities serve the convenience and needs of the communities in which they are chartered to do business;

(2) The convenience and needs of communities include the need for credit services; and

(3) Regulated financial institutions have continuing and affirmative obligation to help meet the credit needs of the local communities in which they are chartered."

(The Community Reinvestment Act, Sec. 802(a), 1977)

Credit and money influence regional economic activity. The degree of influence is far from clear, and no consensus has emerged from the theoretical

or empirical research. There is no question, however, that depository institutions, previously known as banks, act as key intermediaries in regions. The Community Investment Act of 1977 requires their activities to meet needs of the regions in which they are located.

In the United States, research on regional financial activity has focused on spatial segmentation and the impacts of national monetary policy. An important question addressed is whether the regional money supply is exogenously or endogenously determined in an environment of regional separability created by bank branching inside and outside home states. A *de facto* breakdown of regional separability was underway through bank holding companies (BHCs) when Congress passed the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994. This *de jure* elimination of branching restrictions changed the landscape for regional analysts. In short, activities of financial institutions may no longer be linked to specific regions. Home offices now issue consolidated reports to regulatory agencies; the result is that statements on assets and liabilities no longer carry geographic identification.

The purpose of this paper is to explore potential impacts on traditional measures of regional financial activities from structural changes in the financial industry resulting from the Riegle-Neal Act. An important conclusion is that while the Riegle-Neal Act probably yields efficiencies in the financial industry in general, it results in less information about regional financial conditions. In the information age this appears to be a regional paradox that will affect regional analysis in the future.

2. Regional financial activity

Although the regional financial literature is not extensive, several relatively recent studies organize financial theories and highlight important local processes and variables. Some studies focused directly on endogeneity of the supply of money and credit and, in this vein, also focused on the responsiveness of regional nonfinancial activity to changes in monetary policy. While progress was made, no consensus emerged about the importance of regional financial processes. Theoretical and empirical research did reach a general conclusion that interregional financial arbitrage occurs, but an assumption of a perfectly elastic supply of money at some national interest rate seems questionable. Endogenous regional forces appear to exert restraint on financial arbitrage; specifying and measuring the processes through which this occurred remains elusive.

Focus on the supply of money is captured by the traditional money multiplier model

$$M = mB \tag{1}$$

where:

M = The nominal money stock;

m = The money multiplier; and
B = The monetary base.

A more elaborate specification is

$$M = m(i,Y,r)B(TS, d) \tag{2}$$

where:

i = Market interest rate;
Y = Nominal income;
r = Reserve requirement;
TS = Treasury securities held by the Fed; and
d = Discount rate.

Several factors affect the multiplier (m). Therefore, the money supply function is multidimensional. The specification in equation (2) is not satisfactory in a regional context because it misses leakages, such as the funds local banks lend, or invest, outside a region and potential endogeneity associated with spatial factors. The latter is likely to influence both m and B.

Moore and Hill (1982) recognize the former in their specification of a money supply in region R.

$$M_R = [(1+k)/(1-F_R(1-r)(1-v_o)+k+t)]B_R \tag{3}$$

where:

k = Ratio of currency to demand deposits;
F_R = Share of loanable funds spent by borrowers remaining in R;
r = Reserve requirement;
v_o = Share of loanable funds invested outside R;
t = Ratio of time to demand deposits;
B_R = Monetary base in R (reserves plus currency in circulation).

In this case, ΔM_R depends on two regionally specific factors, F_R and v_o. Both have behavioral implications. If a region's financial institutions increase the share of funds invested outside, then the change in the money supply is negative, other things equal. Such realignment of a portfolio results from preferences and decisions of financial managers. Deposits less reserves limit the amount of funds loaned inside or outside a region. The behavior of financial institutions, therefore, has explicit regional implications.

Dow (1987) highlights endogeneity directly with a theoretical model of money and credit. The money multiplier for region R is

$$m_R = m(r, v_o, F_R) \tag{4}$$

where:

r = Reserve requirement;
v_o = The propensity of financial institutions to invest outside R; and
F_R = The propensity of the public to spend in R.

The monetary base is specified as

$$B_R = B(H_R, P_R, C_{d,R}) \tag{5}$$

where:

H_R = Liabilities of the national monetary authority;
P_R = The exogenous components in the balance of payments of R; and
$C_{d,R}$ = The demand for credit in R.

Combining equations (4) and (5) yields a multidimensional regional money supply again.

$$M_R = m(r, v_o, F_R)B(H_R, P_R, C_{d,R}) \quad (6)$$

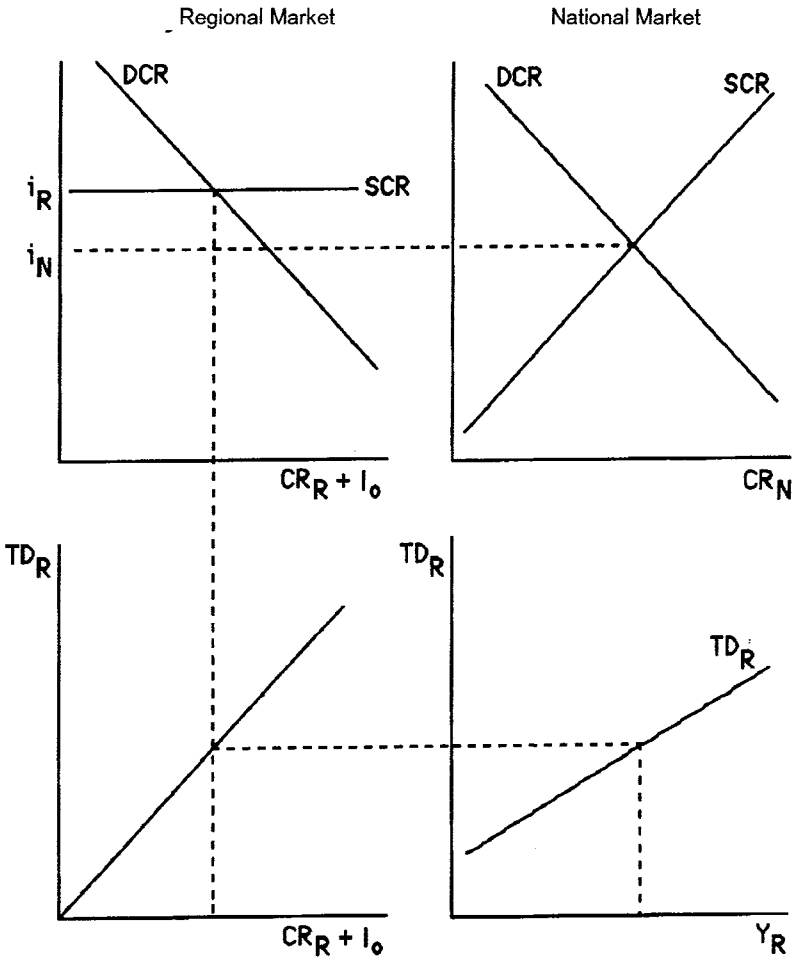
An increase in the local demand for credit, in excess of available supply, leads some local financial institutions to raise funds outside; this boosts the local monetary base. But, once again, an increase in the propensity of local financial institutions to invest funds outside a region lowers its multiplier. A key theoretical conclusion in this case is that a region's money multiplier and its monetary base are endogenous to some extent. In this sense, strict multiplier analysis loses some of its appeal. Nevertheless, institutional phenomena are modeled: higher risk in R and/or expectations of higher returns elsewhere results in realignment of assets from inside to outside. The propensity to realign portfolios exists whether the financial structure is one of unit banking or widespread branching.

Dow emphasized the liquidity preference of financial institutions. High liquidity preference results in balance sheets with a higher share of outside assets. What drives liquidity preference? Confidence and expectations about local assets compared to outside assets. This answer is clear but not empirically specific. The behavior of financial institutions influences the supply of local credit. If regional income limits credit availability, then higher demand will either go unmet or be satisfied by local financial institutions borrowing funds outside and lending at a markup over some national interest rate.

Figure 1 illustrates this process. The horizontal supply of credit in a region (SCR_R) depends on the confidence financial institutions place on local assets. It shifts up or down with changes in confidence. With widespread branching, SCR_R is perfectly elastic throughout; it is not without spatial dimensions, however. Its shape and dependence on confidence of local financial institutions give it a distinct regional characteristic that influences income (Y_R) in the southeast quadrant. Lower confidence (higher liquidity preference) means an upward shift in SCR_R and a higher interest rate in the regional market; this lowers CR_R+I_o and, therefore, lowers Y_R. Moreover, credit restraints affect the length of SCR_R. A shorter length represents greater limits and a potential regional credit crunch if $SCR_R < DCR_R$ at i_R. In an interstate branching environment, financial institutions can easily shift funds to booming regions and away from those perceived to have higher default risks and/or lower expected returns.

A key indicator in a system of widespread branching is the regional ratio of loans to deposits shown in equation (7). LD seems positively related to confidence in a region's assets. Institutional behavior is straightforward. If managers from headquarters outside a region have lower confidence in R and move funds to assets outside, then, other things equal, I_o increases, CR_R decreases and LD_R

Figure 1. National and regional credit markets



DCR = Demand for credit;
SCR = Supply of credit;
TDR = Total deposits;
$CR_R + I_O$ = Local credit plus funds invested outside;
Y_R = Regional income

drops. Decisions made outside R compel branches within R to move assets geographically.

$$LD_R = CR_R/TD_R \tag{7}$$

Porteous (1995) identifies and models institutional behavior that contributes to "funds drainage" from certain regions. An important theoretical conclusion is, assuming no change in characteristics of borrowers, that loanable funds to some regions are a residual of total lending less that in some favored financial core. Funds drainage may be optimal for branching institutions, but it is not optimal for regions that are not financial centers. In addition, problems of asymmetric information arise in assessing risks and expected returns the more spatially remote regions are from financial headquarters. Widespread branching appears to have the potential to cloud even more the distinction between endogenous and exogenous credit flows linked in some way to outside headquarters and inside branches.

Empirical studies add support to propositions about regional segmentation. They have emphasized significantly different regional impacts of national monetary policy. Results show that money and credit do matter in a regionally segmented system. Bias (1992) demonstrates that local real money supplies respond to national monetary policy, open market operations, and changes in the discount rate; but local processes represented by real base income and population exert some influence. His empirical model for a regional money supply is specified as

$$M/P = f(\text{Realfed, Drate, Realbase, Population, e}) \tag{8}$$

where:

Realfed	=	Inflation-adjusted value of the Fed's stock of Treasury securities;
Drate	=	Discount rate;
Realbase	=	Inflation-adjusted value of manufacturing and mining income;
Population	=	Population; and
e	=	Error term.

Estimates on a sample of 12 states from 1967 to 1986 generally conform to expectations. Bias concluded that local money supplies are partly endogenous; national monetary policies have heterogeneous impacts; money and credit matter spatially; and regional macroeconomic models should include local financial indicators.

Interaction between local credit and real economic activity is tested directly by Amos, Kermanu, and Wingender (1994). Accounting for regional credit through a traditional IS/LM model yields a testable hypothesis that regional financial markets play an important role, even when financial capital is perfectly mobile. Growth depends on regional financial markets that they test with equation (9) across 50 states from 1965 to 1985.

$$GR_R = a + b\Psi_R + c\eta_R\rho_R + d_h W_{Rh} + e_R \tag{9}$$

where:

GR_R = Annual growth of state R;

W_{Rh} = A set of h independent variables that can explain the variation in GR across states;

Ψ_R = Direct production effect;

$\eta_R \rho_R$ = Indirect financial effect; and

e_R = Error term.

They report that tests on gross state product show statistical significance for lagged regional variables in 26 states. When the states are split into four regions (Northeast, Midwest, South, and West), tests on equation (9) explain about 50 percent of the variation in growth rates, with indirect financial effects significant in three of four regions. Regional financial activity influences growth and, under conditions specified, the mobility of financial capital is suspect.

Kozlowski (1995) tests the information-content of national financial indicators on two distinctly different regions from 1972 to 1992. With operational channels of transmission through regional financial markets, impulse response functions on specified VAR models trace impacts on real activity from shocks to financial variables. The results point to monetary shocks working through a region's major export industries—durable goods, for example—and through financial processes outlined in theoretical studies of local financial processes. National and regional financial indicators have a potential to provide significant information about changes in real economic activity in regions, a potential that can be exploited in short-run forecasting.

Carlino and DeFina (1996) report differential responses of real personal income in eight regions to increases in the federal funds rate for the 1958-1992 period. Five regions closely approximate the national response, but two respond less and one more than the nation. They link responses to a region's mix of interest-sensitive industries, local banks' abilities to adjust balance sheets, and a mix of large and small borrowers, the former having greater access to nonbank sources of funds. The first factor is the traditional export-base explanation, but others identify institutional factors within regional financial markets. They conclude that complexity of monetary policy is underscored by the spatially disparate responses. Carlino and DeFina (1997) find similar results for 48 contiguous states.

3. The evolving structure of financial institutions

Although regional scientists have made progress in theoretically specifying and empirically measuring some spatial aspects of financial activity, the institutional environment has always been fluid. This institutional environment is now evolving rapidly. Geographic restrictions on banks did yield regional data from reports required by regulatory agencies. Jayaratne and Strahan (1997) point out

that in 1975 no state allowed out-of-state bank holding companies (BHC) to purchase in-state banks. BHCs began to cross borders after 1982, however; and by 1990 49 states permitted purchase of in-state banks by out-of-state institutions. The Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 represents *de jure* removal of geographic limits. Since June 1, 1997, BHCs have been able to unify interstate banks into branch networks. The Riegle-Neal Act, therefore, represents a significant, historic transformation of banking law that is designed to improve efficiency and promote convenience for customers.

Geographic limits on banks restricted efficiency in the industry. Jayaratne and Strahan (1997) present a selection hypothesis: removal of geographic restrictions within states results in expansion of more efficient banks with improved performance of bank assets. They find that high-profit (return on equity) banks grew faster after branching constraints were removed and conclude that weaker banks lost ground to more efficient banks. A positive regional impact is that state growth in production and income accelerates with more efficient banking; impacts are most significant during the first ten years. The Riegle-Neal Act produces benefits for regions through reduced costs, lower interest rates, and increased economic growth.

Table 1 highlights provisions of the Riegle-Neal Act that have direct implications for regional analysis. Sections 102 and 104 reflect a changed institutional structure. Section 102, for example, limits financial concentration as a result of interstate mergers. Section 109 prohibits out-of-state banks from operating deposit production offices in host states. In this case, lending in a host state bears some unspecified relationship to deposits; out-of-state banks need to demonstrate that they are "reasonably helping meet credit needs" in host states. Section 110 specifies that out-of-state banks must also adhere to provisions of the Community Reinvestment Act of 1977. In all cases, federal regulatory agencies are required to monitor institutions in home and host states.

The Riegle-Neal Act explicitly recognized a potential for loss of information associated with an interstate branching system. The Comptroller General was required to assess whether material loss of information would affect regulatory and oversight functions for insured depository institutions. The GAO (1997) concluded that material loss of information is unlikely under the Riegle-Neal Act and, therefore, did not recommend modifying reporting requirements for financial institutions. In short, additional geographic reporting would impose costs that are not justified.

An important issue concerning financial data centers on quarterly reports of condition submitted to federal regulators. With interstate branching, these call reports will increasingly reflect deposits and loans from out-of-state sources; in essence, they will lose geographic meaning. For empirical analyses of regions, call reports did provide the most detail at the highest frequency for deposits and loans. Reports identified loans by type: commercial and industrial, consumer

Table 1. Selected provisions of the Riegle-Neal Act

Section 102 Interstate Bank Mergers

(B) Statewide concentration limits. The responsible agency may not approve an application for an interstate merge transaction if - -

(ii) the resulting bank, upon consummation of the transaction, would control 30 percent or more of the total amount of deposits of insured depository institutions in any such state.

Section 104 Branching by Foreign Banks

(1) Subject to the provisions of this Act and with prior written approval by the Board and the Comptroller of the Currency of an application, a foreign bank may establish and operate a Federal branch or agency in any State outside the home State of such foreign bank to the extent that the establishment and operation ...

Section 109 Prohibition against Deposit Production Offices

(a) Regulations. The appropriate Federal banking agency shall prescribe uniform regulation effective June 1, 1997, which prohibits any out-of-state bank from using any authority to engage in interstate branching pursuant to this title, or any amendment made by this title to any other provision of law primarily for the purpose of deposit production.

(b) Guidelines for Meeting Credit Needs. Regulations issued under subsection (a) shall include guidelines to ensure that interstate branches operated by an out-of-state bank in a host State are reasonably helping to meet credit needs of the communities that the branches serve.

(c) Limitations on Out-of-State Loans.

(1) Limitation. Regulation issued under subsection (a) shall require that, beginning no earlier than 1 year after establishment or acquisition of an interstate branch or branches in a host State by an out-of-state bank, if the appropriate Federal banking agency for the out-of-state bank determines that the bank's level of lending in the host State relative to the deposits from the host State (reasonably determinable from available information including the agency's sampling of the bank's loan files during an examination or such data as is otherwise available) is less than half the average of total loans in the host State relative to total deposits from the host State (as determinable from relevant sources) for all banks the home State of which is such State -

(A) The appropriate Federal banking agency for the out-of-state bank shall review the loan portfolio of the bank and determine whether the bank is reasonably helping to meet the credit needs of the communities served by the bank in the host State; and

(B) If the agency determines that the out-of-state bank is not reasonably helping to meet those needs

(i) The agency may order that an interstate branch or branches of such bank in the host state be closed unless the bank provides reasonable assurances ...

(ii) The out-of-state bank may not open a new interstate branch in the host State unless the bank provides reasonable assurances ...

Section 110 Community Reinvestment Act Evaluation of Banks with Interstate Branches

(a) In General. Section 807 of the Community Reinvestment Act of 1977 (12 U.S.C. 2906) is amended by adding at the end of the following subsections:

(d) Institutions with Interstate Branches.

(1) State-by-state evaluation. In the case of a regulated financial institution that maintains domestic branches in 2 or more states, the appropriate Federal financial supervisory agency shall prepare -

(A) a written evaluation of the entire institution's record of performance under this title ...

Source: Riegle-Neal Interstate Banking and Branching Efficiency Act, Public Law 103-328 [H.R. 3841], September 29, 1994

installment. The reporting level was the bank. With interstate branching, such reporting by banks, not branches, removes spatial characteristics of financial activity. The annual Summary of Deposits does identify deposits by branch, but with a loss of detail and frequency compared to call reports. Although data deficiencies and limits existed for call reports before the Riegle-Neal Act, interstate branching, with reporting from headquarters of consolidated banks, effectively replaces a limited, but useful, source of data with nothing.

Helfer (1997) raises key issues about sources of data from the perspective of the Federal Deposit Insurance Corporation (FDIC), call reports specifically, and the GAO's conclusion that significant loss of information is unlikely. Table 2 shows impacts on reported loans by state from consolidation of multistate bank holding companies into a single lead subsidiary bank. That experiment reveals shrinkage in loans in 38 states due to institutional restructuring. Helfer points out that institution-based reporting erodes information under interstate branching and does lead to material loss of information for the FDIC to fulfill its primary responsibility of regulating insured depository institutions. Moreover, a significant loss of off-site information cannot be overcome by on-site inspections because cyclical lending in regions cannot be observed and measured adequately over time. Loss of geographic banking information is relevant to the FDIC, and that agency recommended changing consolidated reports for banks to reports on loans and deposits identified by states. Such off-site data are important for constructing time series of regional financial activity because, unlike the FDIC, regional scientists do not have on-site access to institutions. Loss of geographic-based data is potentially more significant for tracking trends and testing regional financial theories.

4. Regional Cases

Section 2 presented relationships identified in the regional literature between financial and real activity. Can such relationships actually be measured after the implementation of the Riegle-Neal Act? Time series were constructed from data released in quarterly reports of condition (call reports) and behavior measured and analyzed in the pre- and post-interstate branching environment.

4.1 Selected states

Table 3 reveals wide variation in inflation-adjusted values of deposits and loans among five large states: California, Florida, North Carolina, Ohio, and Texas from 1984 to 1994. This is not unexpected. The nonuniformity with the nation, shown in column one, is striking, however. During this pre-Riegle-Neal period, close associations also existed between deflated deposits (and loans) and real personal income within each state except California (Table 4). Financial

Table 2. Changes that would result from consolidation ($ millions)

State	Domestic Loans as of 3/31/96	Increases*	Decreases**	Net Change $ Amount	Net Change %
AZ	37,290	0	34,840	(34,840)	-93.43
ID	8,837	0	7,973	(7,973)	-90.22
SD	22,814	57	18,359	(18,302)	-80.22
WY	5,648	20	4,158	(4,138)	-73.27
DC	2,091	18	1,494	(1,476)	-70.61
NV	20,370	0	12,899	(12,899)	-63.32
CO	23,778	37	13,909	(13,872)	-58.34
DE	82,150	1,636	46,857	(45,221)	-55.05
NM	8,974	161	4,862	(4,700)	-52.38
WA	61,275	87	32,021	(31,933)	-52.11
TX	155,589	93	76,875	(76,782)	-49.35
MD	50,858	2,118	27,154	(25,036)	-49.23
SC	20,730	44	9,982	(9,938)	-47.94
FL	115,271	459	55,461	(55,001)	-47.71
RI	14,317	2,550	9,089	(6,539)	-45.67
KY	38,470	210	17,694	(17,485)	-45.67
IN	57,285	1,815	27,477	(25,662)	-44.80
ND	8,987	1,278	5,059	(3,781)	-42.07
CT	46,130	0	18,979	(18,979)	-41.14
GA	93,288	24,340	56,699	(32,360)	-34.69
IA	28,405	102	9,447	(9,345)	-32.90
ME	11,291	576	4,264	(3,689)	-32.67
MT	6,280	256	2,141	(1,885)	-30.01
AK	3,223	0	892	(892)	-27.67
KS	21,984	318	5,644	(5,326)	-24.23
WV	14,585	358	3,552	(3,139)	-21.89
LA	27,326	143	6,105	(5,963)	-21.82
NH	13,223	71	2,909	(2,838)	-21.46
OK	21,397	103	4,178	(4,075)	-19.05
TN	48,382	4,354	13,185	(8,831)	-18.25
AR	18,733	1,466	4,430	(2,964)	-15.82
NJ	84,973	3,292	15,426	(12,135)	-14.28
OR	31,570	13,246	17,291	(4,045)	-12.81
NE	21,944	1,847	3,740	(1,893)	-8.63
VA	59,428	4,206	8,477	(4,271)	-7.19
MI	95,308	14,462	20,060	(5,598)	-5.87
WI	56,947	6,707	8,436	(1,730)	-3.04
MS	17,828	1,780	1,834	(54)	-0.30
HI	16,350	270	0	270	1.65
VT	5,848	1,108	649	459	7.85
IL	157,472	42,930	28,020	14,911	9.47
NY	324,757	68,132	28,105	40,027	12.33
UT	13,572	5,257	2,897	2,360	17.39

Table 2 (cont.). Changes that would result from consolidation ($ millions)

State	Domestic Loans as of 3/31/96	Increases*	Decreases**	Net Change $ Amount	Net Change %
CA	375,790	86,365	17,632	68,733	18.29
PA	148,812	32,620	3,619	29,001	19.49
MO	57,656	21,283	1,270	20,013	34.71
MA	84,949	38,579	7,152	31,427	37.00
AL	39,605	20,856	1,875	18,981	47.93
OH	144,333	98,512	3,820	94,692	65.61
MN	45,948	41,803	2,352	39,450	85.86
NC	116,963	164,907	864	164,042	140.25

* The amount of loans reported by banks headquartered in other states before consolidation

** The amount of loans that would be reported by banks in other states after consolidation

Source: U.S. General Accounting Office, *BANK DATA Material Loss of Oversight Information from Interstate Banking is Unlikely*, Appendix II Comments from the Federal Deposit Insurance Corporation, GAO/GGD-97-49, March 1997, p. 28

behavior is spatially dispersed, with atypical contemporaneous associations for California and Texas. Some of the latter can be explained by restructuring before the Riegle-Neal Act. For example, in Texas the number of commercial banks dropped from 1,854 with 339 branches in 1984 to 980 with 2,376 branches in 1994.

More important is the fact that contemporaneous correlations deteriorate during the post-1994 period, especially after 1997, although lack of observations limits quantitative analysis. In Ohio, for example, the correlation between deflated loans (RLNS) and real personal income (RPI) drops from +.972 for the 1984-1994 to +.939 for 1995-1998 to +.681 for 1997-1998. From 1970 to 1997, the number of commercial banks in Ohio declined from 514 to 235, but branches increased from 1,304 to 2,956. Such changes occurred in each state and the nation as a whole. By 1997, 9,125 insured commercial banks existed in the United States, down about one-third from 1970; but branches were up about 180 percent.

The FDIC experiment from Table 2 reveals a threat to geographic-based financial data posed by consolidated reporting from depository institutions. In March 1996, for example, consolidated reporting would have resulted in a 140 percent jump in the current-dollar value of domestic loans in North Carolina. Panel A in Figure 2 illustrates actual time series. As predicted by the FDIC, deposits and loans jumped considerably after consolidated reporting in 1997.

Table 3. Correlations: deposits and loans, 1984-1994

	USRDEP	CARDEP	FLRDEP	NCRDEP	OHRDEP	TXRDEP
USRDEP	1	0.531845	0.751759	0.694887	0.895370	-0.326999
CARDEP	0.531845	1	0.108749	-0.005792	0.250427	0.171426
FLRDEP	0.751759	0.108749	1	0.978191	0.952364	-0.841443
NCRDEP	0.694887	-0.005792	0.978191	1	0.925338	-0.870201
OHRDEP	0.895370	0.250427	0.952364	0.925338	1	-0.681151
TXRDEP	-0.326999	0.171426	-0.841443	-0.870201	-0.681151	1
	USRLNS	CARLNS	FLRLNS	NCRLNS	OHRLNS	TXRLNS
USRLNS	1	0.245031	0.667131	0.235802	0.417030	-0.180476
CARLNS	0.245031	1	-0.231295	-0.635536	-0.515106	0.281205
FLRLNS	0.667131	-0.231295	1	0.759061	0.933919	-0.820243
NCRLNS	0.235802	-0.635536	0.759061	1	0.902497	-0.698487
OHRLNS	0.417030	-0.515106	0.933919	0.902497	1	-0.853707
TXRLNS	-0.180476	0.281205	-0.820243	-0.698487	-0.853707	1

Note: First two letters indicate the state, e.g., CA=California. RDEP is the deflated value of deposits and RLNS is the deflated value of loans

For North Carolina, deposits rose 93 percent from 1996 to 1997 but personal income increased only 7 percent. Panel B shows a similar jump in Ohio.

Figure 3 shows the opposite for Florida and Texas: reported deposits and loans move down after 1997. In the states examined here, actual time series that were constructed from quarterly reports issued by depository institutions confirm the position taken earlier by the FDIC. Depository institutions' consolidated reporting in the interstate branching environment after the Riegle-Neal Act represents a significant loss of information about trends in regional economies.

If the deflated value of deposits (RDEP) is used as a proxy for the regional supply of money specified in equations (6) and (8), then this local monetary aggregate can be expected to behave somewhat like its national counterpart, M2, which is a leading indicator of real economic activity. Cross correlations between state real personal income and deflated deposits, with lags from one to twelve quarters, are shown in Figure 4. Significant leads occurred during the 1984-1994 period, but they deteriorated after 1994.

The loans-to-deposits ratio (LD) for states not only varies over space and time, but is also affected by structural changes. In the interstate branching environment, funds drainage and regional deposit production seem more likely. Although LD rose on average in the United States during the post-1994 period, in North Carolina and Ohio increases were large. In North Carolina, for example, the average LD rose from .94 for the 1984-1994 period to 1.16 for the post-

Table 4. Contemporaneous correlations, 1984-1994

	BANKS	RDEP	RLNS	RPI
U.S.				
BANKS	1	-0.248544	-0.004806	-0.954238
RDEP	-0.248544	1	0.797370	0.490786
RLNS	-0.004806	0.797370	1	0.266288
RPI	-0.954238	0.490786	0.266288	1
California				
BANKS	1	0.818401	0.692992	-0.014823
RDEP	0.818401	1	0.810586	0.020353
RLNS	0.692992	0.810586	1	-0.337672
RPI	-0.014823	0.020353	-0.337672	1
Texas				
BANKS	1	0.984755	0.956296	-0.894013
RDEP	0.984755	1	0.971933	-0.837811
RLNS	0.956296	0.971933	1	-0.768461
RPI	-0.894013	-0.837811	-0.768461	1
Florida				
BANKS	1	-0.385976	-0.403548	-0.579352
RDEP	-0.385976	1	0.960658	0.935498
RLNS	-0.403548	0.960658	1	0.896490
RPI	-0.579352	0.935498	0.896490	1
North Carolina				
BANKS	1	0.735743	0.652882	0.634306
RDEP	0.735743	1	0.956900	0.922489
RLNS	0.652882	0.956900	1	0.980921
RPI	0.634306	0.922489	0.980921	1
Ohio				
BANKS	1	-0.686112	-0.933806	-0.973316
RDEP	-0.686112	1	0.859807	0.761692
RLNS	-0.933806	0.859807	1	0.972019
RPI	-0.973316	0.761692	0.972019	1

BANKS is the number of banks; RDEP is the deflated value of deposits; RLNS is the deflated value of loans; RPI is real personal income

1994 period, which is about ten-times greater than the increase in Texas. In terms of funds drainage or regional deposit production, therefore, consolidated reports do not allow off-site measurement or geographic identification for flows of either deposits or loans.

Figure 2. Deposits and loans: North Carolina and Ohio (current dollars, quarterly)

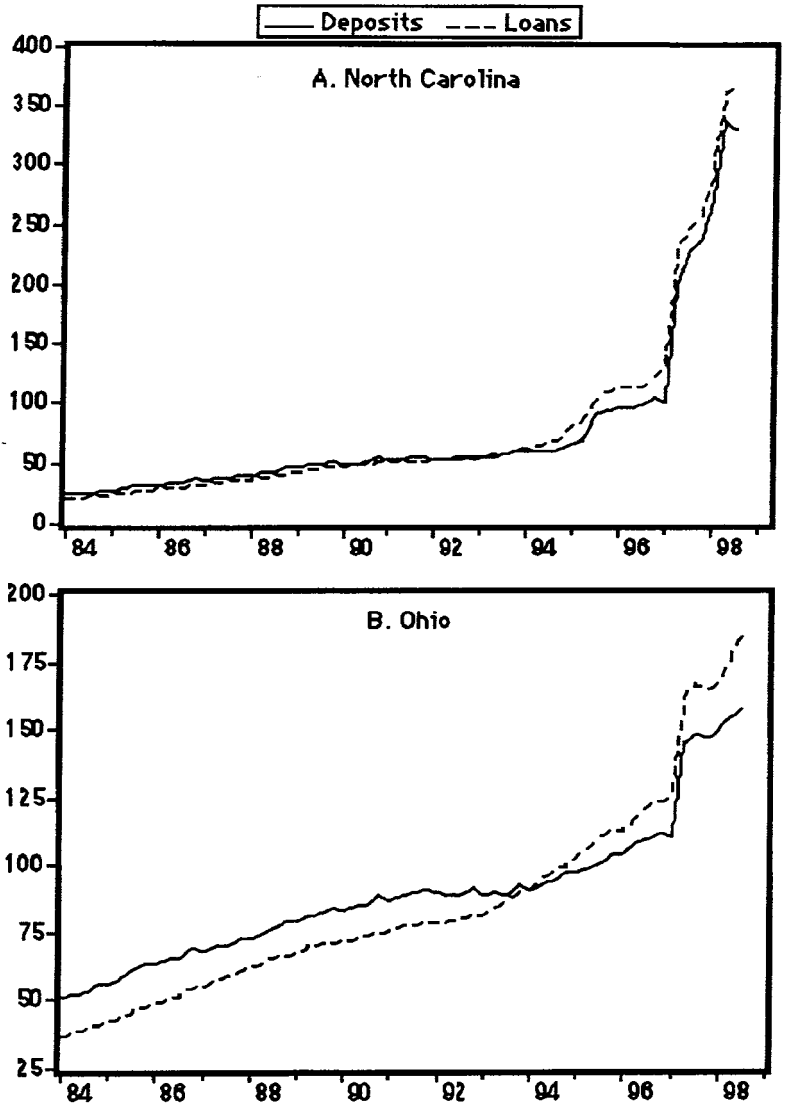


Figure 3. Deposits and loans: Florida and Texas (current dollars, quarterly)

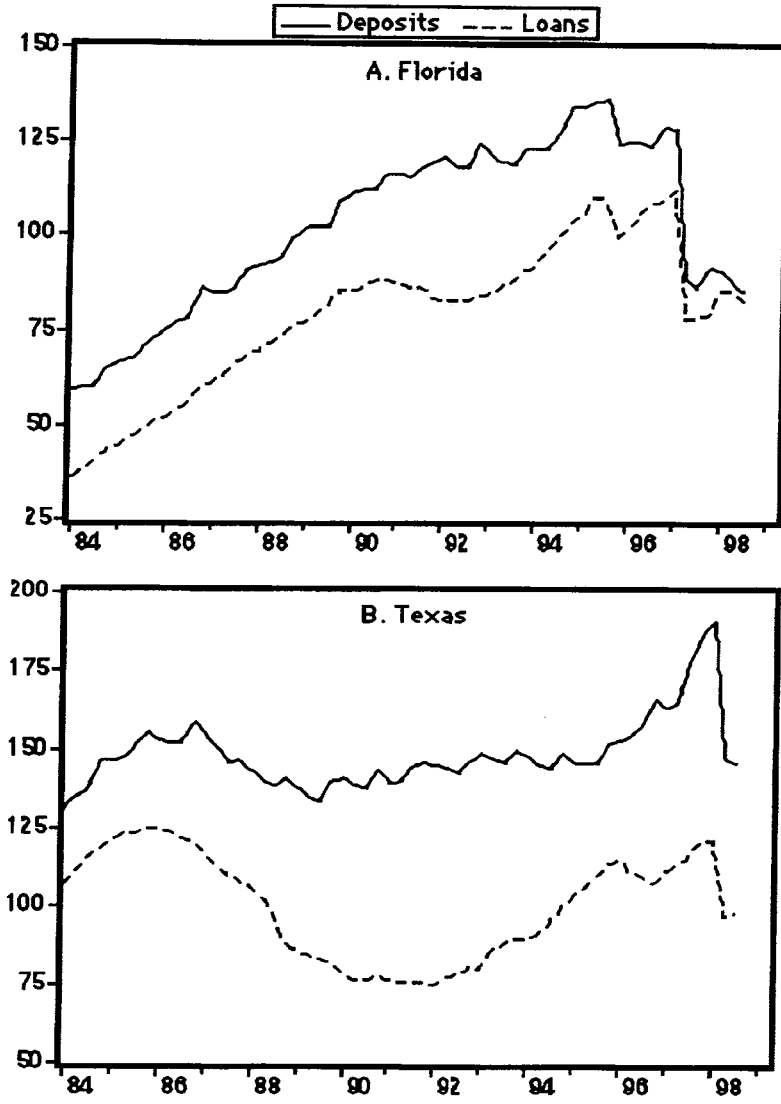
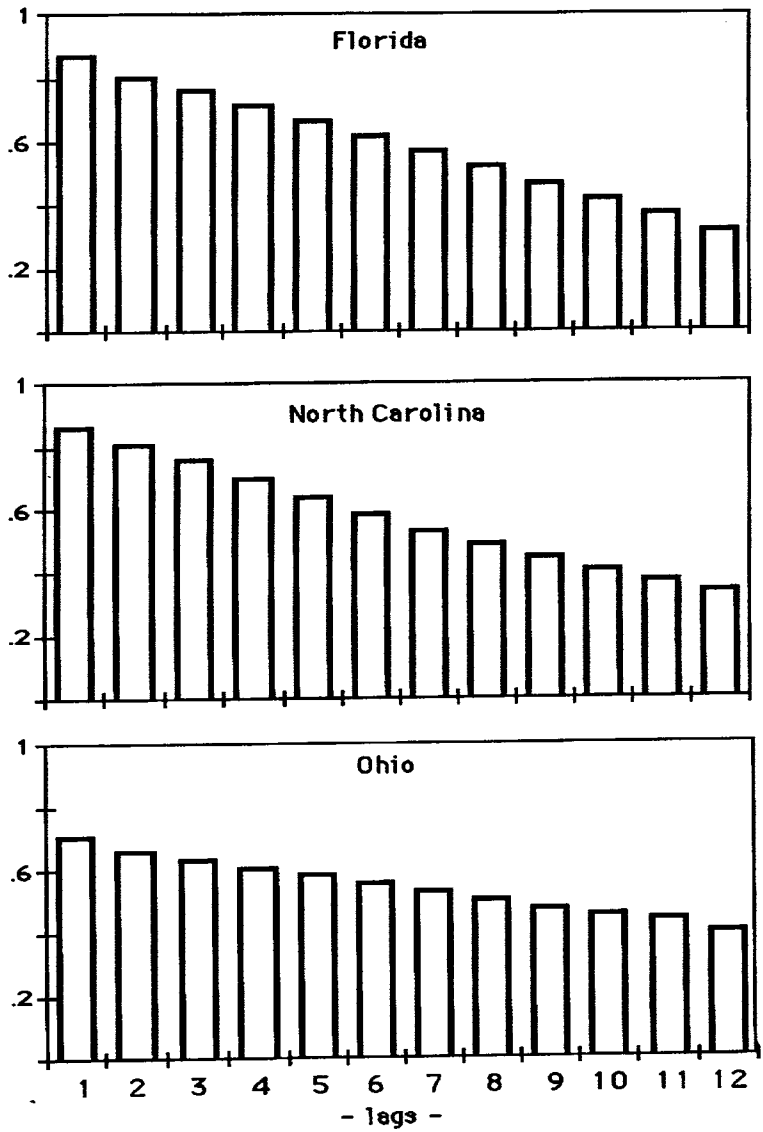


Figure 4. Cross correlations: quarterly real personal income and deflated deposits, 1984-1994



4.2 A metropolitan region

For smaller, economically integrated regions such as MSAs, mergers, acquisitions, and consolidated reporting after the Riegle-Neal Act essentially have eliminated the meaning of traditional local financial indicators. This situation is more critical than at the state level because of the lack of other, frequently used indicators such as quarterly personal income.

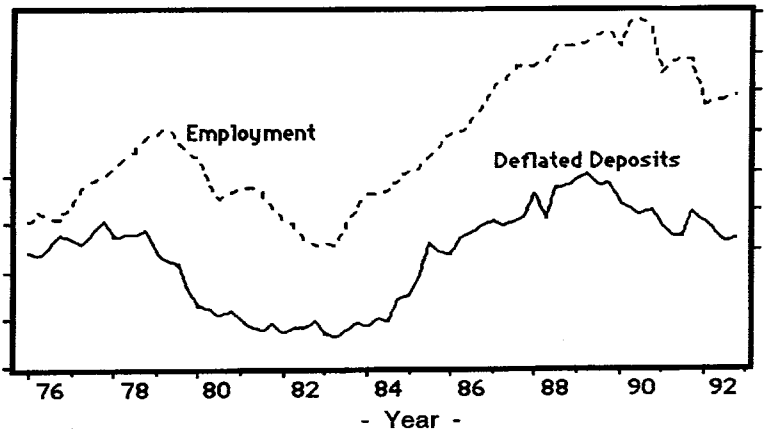
Seventy depository institutions operate within the Toledo, Ohio MSA; 63 have headquarters in this three-county region. Those figures mask the underlying problem caused by structural changes. In the 1980s, for example, five large banks accounted for more than 85 percent of deposits in the MSA. Deposits and loans, along with their links to real economic activity, could be measured from time series constructed from quarterly reports of condition. Figure 5 illustrates the behavior of deposits and employment in the Toledo MSA from 1976 to 1992. Cross correlations between employment and deflated deposits for this period show highly significant lags from one to four quarters, with the most significant at two quarters. These results are similar to those shown in Figure 4 for three states.

The large, major financial institutions now have headquarters in other regions. The result is that while deposit and loan activities continue in the metropolitan area, consolidated reporting eliminates the geographic designation for measurement and tracking. Moreover, reports for metropolitan areas with large financial institutions engaged in interstate branching, Cleveland for example, are specific for the institution regardless of where deposits and loans originate. For the Toledo MSA, two of the large institutions that accounted for a high percentage of deposits issue consolidated reports from Cleveland. For both MSAs, therefore, quarterly data on deposits and loans from call reports are no longer meaningful in any regional sense. Metropolitan financial indicators, such as the deflated deposits displayed in Figure 5, no longer can be constructed from institutional reports. Reported deposits and loans for many institutions have little relationship to real economic activity in a metropolitan region. The close associations revealed by Figure 4 for states and Figure 5 for a metropolitan area still may exist, but they no longer can be measured with either the frequency or imperfect precision that existed in the pre-Riegle-Neal environment.

5. Summary

The Riegle-Neal Act of 1994 changed the environment for research about regional financial activity. Empirical testing and verification of relationships in local markets will be more difficult in the future because of rapid changes in the financial industry and limitations resulting from those changes. In the past, regional scientists have dealt with data limitations in creative ways, but

Figure 5. Employment and deposits: Toledo, Ohio MSA



consolidated reporting by depository institutions after 1997 appears to have removed the ability to measure activity in any consistent way for the regional quadrants of Figure 1. In the information age, data for depository institutions are easily accessible from regulatory agencies such as Federal Reserve Banks and the Federal Deposit Insurance Corporation. Accessible data are institution-based in the interstate branching system, but the geographic content is limited. This seems to be a regional paradox in the information age. Moreover, local financial industries seem headed toward a two-tier system of a few larger interstate and many smaller locally concentrated depository institutions.

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