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Federal Reserve Bank of Dallas

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of Regional Banking Difficulties***

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The Movement Toward Nationwide Banking:

Assessing the Role of Regional Banking Difficulties

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Large numbers of relatively small, local banking organizations distinguish the U.S. financial system from the majority of systems found in other countries, reflecting, in part, a long history of geographic restrictions in this country. These restrictions resulted from fears that large financial institutions might develop excessive power and become unresponsive to the needs of local businesses, small banks' desire to restrict competition from larger institutions, and numerous other forces.

A key component of the geographic restrictions placed on full-service banking involved limitations on the ability of institutions to cross state lines. The McFadden Act, as amended in 1933, restricted the branching rights of national banks in a given state to those established by the state's authorities for state-chartered banks. This legislation effectively precluded national banks from branching across state lines. The Douglas Amendment to the Bank Holding Company Act of 1956 further restricted interstate expansion by barring bank holding companies from acquiring a bank in another state unless that state specifically authorized the transaction.

Until recently, states made little use of their authority to allow interstate banking through holding company transactions. But that situation changed dramatically during the 1980s, and a recent compilation of interstate banking laws found that all but two

states permit some form of interstate banking. Even so, the nature of the interstate banking laws recently enacted varies considerably from state to state, from fairly restrictive regional banking pacts to relatively open laws allowing entry of bank holding companies from any state.

Numerous developments played a role in the recent trend of falling barriers to interstate banking.¹ But perhaps one of the most powerful precipitating forces was the emergence of regional financial-sector difficulties that gave rise to imbalances in bank capital between states.

The purpose of this article is to provide new evidence on the importance of regional banking difficulties in motivating an increasing number of states to adopt relatively unrestrictive interstate banking laws. The findings suggest that regional banking difficulties did serve to undermine the system of interstate banking restrictions, as states with depleted bank capital levels opened their borders to out-of-state banking organizations in an effort to strengthen their weakened banking sectors. By inhibiting geographic diversification among banks, interstate banking restrictions arguably contributed to the severity of recent regional banking downturns, thereby setting the stage for their own demise.

Regional Banking Difficulties as a Motive for Interstate Banking

Bernanke and Gertler (1987) demonstrate how, under certain conditions, the financial health of the banking sector can affect the allocation of resources and the level of economic activity. In their view, an adverse shock to the banking sector reduces lending capacity, since bank depositors concerned over the safety of their deposits

¹ See Rose (1989) for a detailed account of the recent development of interstate banking and a description of its motivating forces. Also, see Clair and Tucker (1989) for a historical account of Federal Reserve policy toward interstate banking.

require banks to reduce the quantity of loans extended to fund risky ventures and to place a larger share of bank assets in relatively safe investments.² The resulting reduction in lending activity has the potential to produce a “credit crunch,” in which the decrease in bank lending restricts economic growth.

Samolyk (1989) extends this line of thought by considering the potential impact of adverse shocks to a regional banking sector on regional economic activity. To the extent that the banking system is segmented into distinct regional banking sectors, an adverse shock to the banking sector in a given region could generate a corresponding reduction in regional lending activity, as stronger banks in surrounding regions would be unable to help maintain lending levels in the affected area. The resulting reduction in regional lending activity would then have the potential to restrict regional economic growth.

Inssofar as interstate banking restrictions were perceived as a major factor contributing to a regional segmentation of the country’s banking system, state lawmakers may have viewed the removal of those restrictions as a viable method for avoiding a perceived regional credit crunch. Disagreement exists among previous studies regarding the extent to which regional banking difficulties actually did contribute to regional economic downturns.³ However, for purposes of the argument developed here, it is

necessary only that state lawmakers *perceived* that downturns in regional banking conditions *could* adversely affect regional economic performance. To the extent that this occurred, states with banking difficulties may have adopted relatively unrestrictive interstate banking laws in an effort to promote adequate lending services for local businesses.

In addition, state lawmakers may have viewed the removal of interstate banking restrictions as an appropriate response to regional banking difficulties, even if those difficulties were not seen as having a potentially adverse impact on regional economic growth. In particular, the removal of interstate banking restrictions simply may have been viewed as a necessary step for the revitalization of the banking sector itself.⁴ By allowing out-of-state bank holding companies to acquire local banking firms, unrestrictive interstate banking laws may have provided states with an effective mechanism for attracting new bank capital. The central idea under investigation here is that such considerations actually played an important role in motivating an increasing number of states to open their borders to relatively unrestricted interstate banking.

Regional Distribution of Interstate Banking Laws

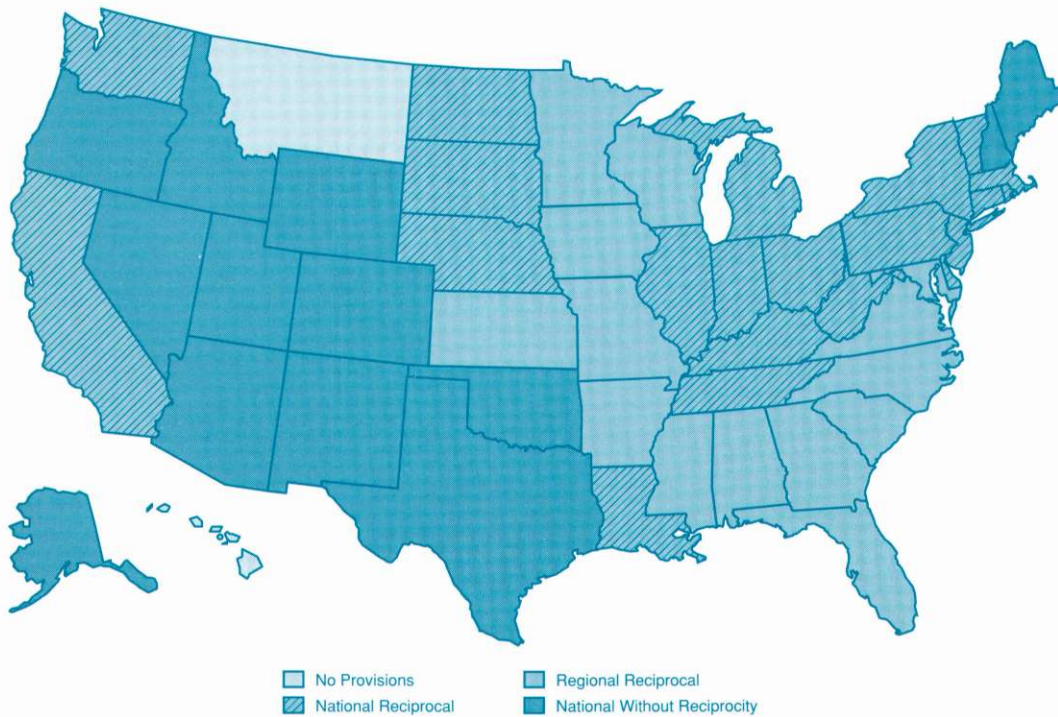
Three categories of interstate banking law. The laws recently enacted to allow interstate banking vary considerably from state to state. Different states have chosen to retain different restrictions with regard to a number of factors, including, but not limited to, the range of states from which bank holding companies are allowed to acquire banks in the home state, whether bank holding companies headquartered in the home state must be allowed to acquire banks located in the state in which an acquiring bank holding company is headquartered, whether *de novo* entry of out-of-state bank holding companies is permitted, and the minimum allowable age of banks acquired by out-of-state organizations.

² This framework must be altered somewhat to address the current banking environment, in which the federal government guarantees, explicitly or implicitly, a large proportion of bank deposits. When the safety of bank deposits is guaranteed, as under federal deposit insurance, then the government assumes the monitoring and disciplining role that otherwise would be provided by depositors.

³ See Moore (1992) and the references cited there.

⁴ See Gunther (1992) for a discussion of the incentives bank owners may have either to support or oppose the removal of interstate banking restrictions.

Chart 1
Interstate Banking Laws



SOURCE: Amel (1991).

For purposes of the analysis here, it is convenient to abstract from some of these details and to rank the openness of the various interstate banking statutes on the basis of two primary factors: 1) whether the law permits bank holding companies headquartered in any state to acquire banks in the home state or, instead, limits entry only to bank holding companies headquartered in specific states, and 2) whether the law requires that bank holding companies headquartered in the home state must be allowed to acquire banks in the states in which acquiring bank holding companies are headquartered; that is, whether the law requires reciprocity.

On the basis of these two factors, the various interstate banking laws can be divided into the following three major categories: 1) regional reciprocal laws, under which only bank holding companies head-

quartered in a certain group of states are permitted to acquire banks in the home state and reciprocity is required, 2) national reciprocal laws, under which bank holding companies headquartered in any state are allowed to acquire banks in the home state and reciprocity is required, and 3) national laws without the reciprocity requirement, under which bank holding companies in any state are allowed to acquire banks in the home state and reciprocity is not required. Note that these categories form a hierarchy, with regional reciprocal laws constituting the most restrictive type of interstate banking law and national laws without the reciprocity requirement constituting the most open type of law.

Recently adopted interstate banking laws. Chart 1 shows the type of interstate banking law most recently adopted by each state, as documented in Amel (1991).

Only two states, Hawaii and Montana, have not provided for one of the three forms of interstate banking defined above.⁵ Among the remaining states, the national, national reciprocal, and regional reciprocal forms of interstate banking laws are each widely used.

A significant number of states have adopted national interstate banking laws without reciprocity requirements. Thirteen states, along with the District of Columbia, allow bank holding companies headquartered in any state to acquire banks within their borders and do not require reciprocity. As shown in Chart 1, ten of these states are located in a band stretching northwestward from Texas and Oklahoma through Oregon and Idaho. Maine, New Hampshire, and Alaska also have adopted national interstate banking laws without the reciprocity requirement.

The majority of states using national reciprocal laws are concentrated in a band stretching southwestward from New England through Illinois, Kentucky, and Tennessee. North Dakota, South Dakota, and Nebraska also have adopted this form of law. In all, twenty-one states allow bank holding companies headquartered in any state to acquire banks within their borders as long as similar privileges are granted to their bank holding companies.

Regional reciprocal laws are prevalent in the Southeast, South Atlantic region, and throughout a band stretching northward from Arkansas through Wisconsin and Minnesota. Fourteen states permit only bank holding companies headquartered in certain other reciprocating states to acquire banks within their borders.

Regional Differences in Banking-Sector Strength

The diversity in the interstate banking laws adopted by the various states is matched by the variability in regional banking conditions that occurred during the past ten years. Chart 2 shows the minimum year-end adjusted capital ratio that occurred for each state's banking sector during the 1982–91 period. The adjusted capital ratio is defined as the difference between the following two components: 1) the equity capital ratio, which is the ratio of equity capital to gross assets, and 2) the adjusted troubled asset ratio, which is the ratio of other real estate owned, nonaccrual loans, and loans past due 90 days or more to gross assets minus the ratio of loan loss reserves to gross assets. A negative value for the adjusted troubled asset ratio would indicate that a state's banking sector had more loan loss reserves than troubled assets. As a measure of banking-sector strength, the adjusted capital ratio attempts to incorporate both the potential for losses, as indicated by the level of foreclosed real estate and noncurrent loans, and the capacity to absorb losses, as indicated by the level of equity capital and loan loss reserves.

As shown in Chart 2, thirteen states maintained adjusted bank capital ratios above 6 percent, and the adjusted capital ratio remained above 5 percent in an additional nine states. Many of the states in these two relatively strong groups are located in the Southeast, South Atlantic region, Midwest, and Great Lakes region.

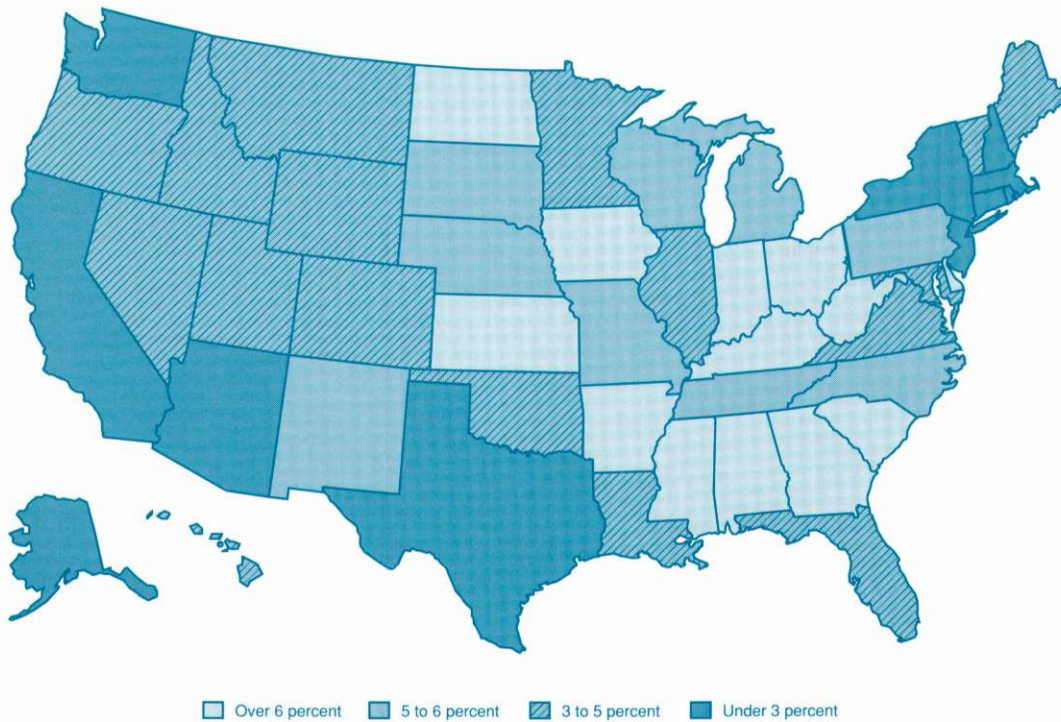
In contrast to the relatively strong performance of states in the first two groups, many other states experienced sharp regional recessions and correspondingly adverse banking conditions. The minimum adjusted capital ratio fell between 3 percent and 5 percent in 17 states and dropped below 3 percent in an additional eleven states and the District of Columbia. Many of the hardest hit states are located in the West, Southwest, and Northeast.

The regional diversity in both banking-

⁵ In the case of Hawaii, banks may be acquired by bank holding companies headquartered in American Samoa, Guam, the Marshall Islands, Micronesia, the Northern Marianas, and Palau. Only failing banks may be acquired by bank holding companies headquartered in other states. Montana has not provided for interstate banking of any form.

Chart 2

Adjusted Capital Ratio for State Banking Sectors, Minimum for the Period 1982–91



SOURCE: Report of Condition and Income.

sector health and the openness of interstate banking laws leads to the possibility that the two phenomena are related. And a casual comparison of Charts 1 and 2 hints at such a linkage, as the shading of the two charts follows a somewhat similar regional pattern. A correspondence between regional banking difficulties and the openness of state statutes pertaining to interstate banking would support the idea that regional capital imbalances contributed to the recent relaxation of the longstanding geographic restrictions placed on banking organizations.

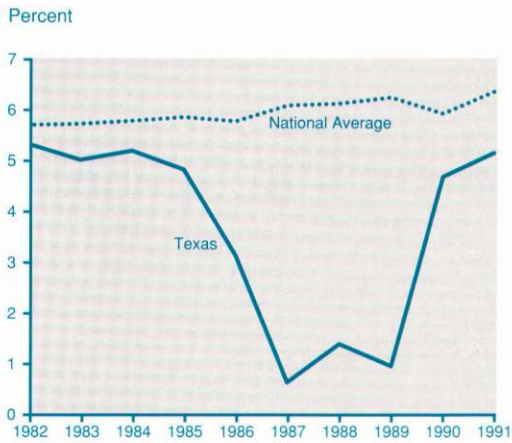
Banking-Sector Strength and the Choice of Interstate Banking Law

The case of Texas. The importance of regional bank capital shortages in precipitating the removal of interstate banking

restrictions has been especially clear in certain cases. In particular, within the Eleventh District, the removal of interstate banking restrictions in Texas can be traced to the need to attract new bank capital in the aftermath of the state's severe banking downturn.

Chart 3 compares the adjusted capital ratio for Texas banks with the average ratio for all states. The Texas capital ratio fell sharply during the 1986–87 period, as the state's energy and real estate sectors led the regional economy into a severe recession. National interstate banking, with no reciprocity requirement, became effective in January 1987, as the state attempted to attract the capital needed to resolve its banking difficulties. While the timing of this legislation suggests that a regional capital shortage was an important determinant of the movement to unrestricted interstate banking in

Chart 3
Adjusted Capital Ratio for State Banking Sectors, Texas Versus National Average



SOURCE: Report of Condition and Income.

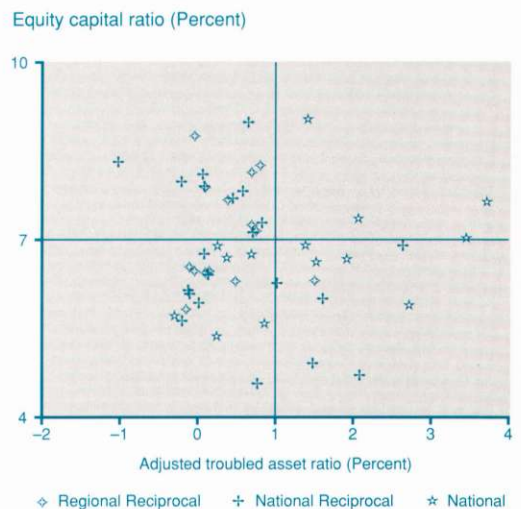
Texas, the importance of regional banking difficulties generally in contributing to the removal of interstate banking restrictions remains to be seen.

Cases of national interstate banking without reciprocity. Chart 4 shows the equity capital ratio and the adjusted troubled asset ratio for each state at the beginning of the year in which the state's most recent type of interstate banking law became effective.⁶ Because the states are identified by the type of interstate banking law they adopted, Chart 4 can be used to form a rough assessment of the strength of any association between regional banking-sector strength and the various forms of interstate banking law. States located in the upper left quadrant of Chart 4 had relatively strong banking sectors when they implemented their interstate banking statutes, as evidenced by both high capital ratios and low adjusted

troubled asset ratios. Conversely, states located in the lower right quadrant had relatively weak banking sectors, as indicated by both low capital ratios and high adjusted troubled asset ratios. Location in the lower left quadrant indicates a relatively low adjusted troubled asset ratio, but also a relatively low equity capital ratio. The upper right quadrant corresponds to relatively high equity capital ratios and also relatively high adjusted troubled asset ratios.

Chart 4 points to a positive relationship between financial difficulty in state banking sectors and the openness of state laws pertaining to interstate banking, thereby supporting the idea that regional imbalances in banking conditions contributed to the removal of interstate banking restrictions. Of the fourteen instances of the most open form of interstate banking law—national interstate banking without the reciprocity requirement—none fall into the upper left quadrant, which is associated with banking-sector strength. In contrast, 43 percent of the states with national reciprocal laws and 50 percent of the states with regional recip-

Chart 4
Equity Capital Ratio and Adjusted Troubled Asset Ratio by Type of Interstate Banking Law



SOURCE: Amel (1991); Report of Condition and Income.

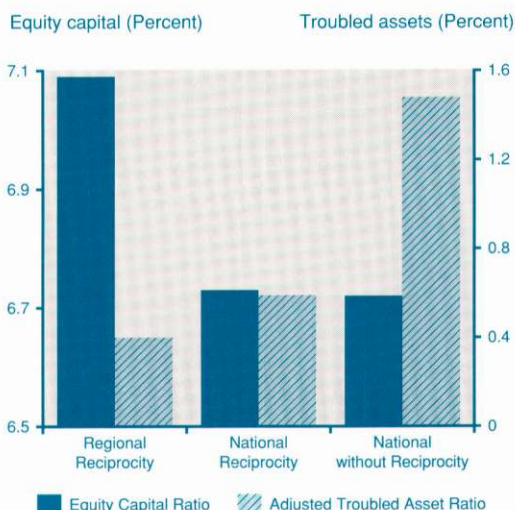
⁶ For the few states that adopted their most recent type of interstate banking law in 1982, data availability constraints necessitated measuring the ratios on an end-of-year rather than beginning-of-year basis.

rocal laws are located in that quadrant. Moreover, only 24 percent of the states with national reciprocal laws and 7 percent of the states with regional reciprocal laws fall into either the upper-right or lower-right quadrants, both of which correspond to relatively high levels of troubled assets. In contrast, 57 percent of the instances of national interstate banking without reciprocity are located in those two quadrants.

These figures are consistent with the view that the emergence of regional banking difficulties helped motivate the removal of interstate banking restrictions through the adoption of national interstate banking laws with no reciprocity requirement. However, while Chart 4 offers a detailed view of the data on banking-sector strength for individual states, its usefulness in terms of drawing inferences on the relationship between regional banking difficulties and the choice of interstate banking law is somewhat limited. In particular, the proportion of states in each of the four quadrants depends partially on the positioning of the lines that separate the quadrants. A simple method of overcoming this potential drawback is to calculate the average capital and adjusted troubled asset ratios for states adopting each type of interstate banking law. Comparisons can then be made between the average level of banking-sector strength associated with each type of law.

An analysis of the average equity capital ratio and the average adjusted troubled asset ratio for each of the three types of interstate banking law also points to a positive relationship between banking-sector difficulties and the openness of interstate banking statutes. Chart 5 shows the average equity capital ratio and the average adjusted troubled asset ratio that prevailed in states choosing each type of interstate banking law.⁷ The figures shown are consistent with the view that states with unrestrictive laws allowing for national interstate banking without reciprocity tended to have lower equity capital ratios when they implemented their interstate banking statutes than states that allowed only regional interstate bank-

Chart 5
Equity Capital Ratio and Adjusted Troubled Asset Ratio, Average by Type of Interstate Banking Law



SOURCE: Amel (1991); Report of Condition and Income.

ing. In addition, Chart 5 suggests that states choosing national interstate banking without the reciprocity requirement tended to have higher adjusted troubled asset ratios than both states that allowed only regional interstate banking and states that permitted national interstate banking but required reciprocity.⁸

These results also are consistent with the view that regional banking difficulties were an important force behind the adoption of state laws permitting national interstate banking without reciprocity. It should be

⁷ The figures portrayed in Chart 5 are averages, by type of interstate banking law, of the figures for individual states given in Chart 4.

⁸ While the differences in the ratios across types of interstate banking law may appear small, their economic significance can be considerable. Because banks tend to operate with fairly low capital ratios, even a relatively small adverse change in either the capital ratio or the adjusted troubled asset ratio can represent a substantial increase in financial difficulty and necessitate strong corrective action.

noted, though, that a variety of statistical considerations preclude using Charts 4 and 5 by themselves to form statistically reliable assessments of the association between the choice of interstate banking law and either the capital ratio or the adjusted troubled asset ratio. However, the conclusions reached here regarding the relationship between regional banking difficulties and the removal of interstate banking restrictions receive additional support of a more formal nature in Gunther (1992), where a statistical technique known as probit analysis is used to identify the determinants of the adoption of interstate banking without reciprocity. The statistical results reported there are qualitatively identical to the findings based on Charts 4 and 5.⁹ In summary, a considerable amount of evidence exists that regional banking downturns played a major role in motivating the increased use of relatively unrestrictive interstate banking laws.

Concluding Remarks

The geographic restrictions historically applied to full-service banking in this

country arguably contributed to the numerous regional banking downturns that have occurred in recent years. By reducing the ability of banking organizations to spread their operations across diverse regional economies, geographic restrictions increased the vulnerability of bank net earnings to adverse region-specific economic shocks.¹⁰

The resulting frequency and severity of recent regional banking difficulties then served to undermine the system of geographic restrictions. Regional imbalances in banking-sector strength led states seeking new capital to remove geographic restrictions through the adoption of relatively unrestrictive interstate banking laws.

The breakdown of interstate banking restrictions provides a clear example of a regulation that self-destructed. In this respect, interstate banking restrictions are similar to a variety of other artificial constraints, including interest rate ceilings and various product-line restrictions, that recently were lifted from U.S. financial institutions only after they had caused substantial harm.

⁹ For example, the statistical estimates reported there suggest that, for a representative state, a 50 basis-point reduction in the equity capital ratio, together with a similar increase in the adjusted troubled asset ratio, increases the probability of adopting national interstate banking without reciprocity from 15 percent to 37 percent.

¹⁰ It should be emphasized, however, that geographic restrictions alone cannot totally explain recent financial-sector difficulties, as evidenced by the financial problems that occurred among very large banks possessing substantial diversification possibilities.

References

- Amel, Dean F. (1991), "State Laws Affecting Commercial Bank Branching, Multibank Holding Company Expansion, and Interstate Banking," unpublished manuscript, Board of Governors of the Federal Reserve System, May.
- Bernanke, Ben S., and Mark Gertler (1987), "Banking and Macroeconomic Equilibrium," in *New Approaches to Monetary Economics*, ed. William A. Barnett and Kenneth J. Singleton (New York: Cambridge University Press), 89-111.
- Clair, Robert T., and Paula K. Tucker (1989), "Interstate Banking and the Federal Reserve: A Historical Perspective," Federal Reserve Bank of Dallas *Economic Review*, November, 1-20.
- Gunther, Jeffery W. (1992), "Regional Capital Imbalances and the Removal of Interstate Banking Restrictions," Financial Industry Studies Working Paper 5-92, Federal Reserve Bank of Dallas (Dallas, December).
- Moore, Robert R. (1992), "The Role of Bank Capital in Bank Loan Growth: Can the Market Tell Us Anything that Accountants Don't?" Federal Reserve Bank of Dallas *Financial Industry Studies*, this issue.
- Rose, Peter S. (1989), *The Interstate Banking Revolution: Benefits, Risks, and Trade-offs for Bankers and Consumers* (Westport, Conn.: Quorum Books, Greenwood Press, Inc.).
- Samolyk, Katherine A. (1989), "The Role of Banks in Influencing Regional Flows of Funds," Federal Reserve Bank of Cleveland, Working Paper 8914 (Cleveland, November).

Acknowledgment

The author would like to thank, without implicating, Dean F. Amel for helpful discussions.

The Role of Bank Capital in Bank Loan Growth:

Can the Market Tell Us Anything that Accountants Don't?

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Recent sluggishness in bank lending has led to concern that a lack of bank credit may be dampening economic activity. A number of analysts have focused on the importance of bank credit recently by examining the role of banks in contributing to a "credit crunch," in which a lack of credit to creditworthy borrowers reduces real economic activity.¹ While the formal evidence on the existence of a credit crunch is mixed, anecdotal reports of a credit crunch were common during 1991, and thus I focus on lending during that year.

Regardless of whether a credit crunch existed during my sample period, there was a great deal of variability in loan growth across bank holding companies. While total lending by the holding companies in my sample declined slightly, loan growth ranged from sharp contraction to strong expansion at individual holding companies. Hence, if there was a credit crunch, the effects were more severe among borrowers at some banks than at others, and if there was not a credit crunch, credit availability may nevertheless have been restricted for some borrowers. Therefore, in addition to the difficulties caused by a low *level* of loan growth in a credit crunch, the *variability* of loan growth may cause additional problems.

Given the potential effects of the variability in loan growth, I wish to explain the

cause of differences in loan growth across bank holding companies. To accomplish this, I examine the effects of bank holding company capital on loan growth. Bank capital is important because it may constrain banks' lending, thereby contributing to loan growth variability and possibly leading to a credit crunch. The influence of capital on lending may occur through its influence on the relationship between the bank and its depositors² or through its influence on the regulatory treatment of banks.

Other analysts have considered the role of bank financial condition on bank lending.³ These studies primarily have considered capital as measured by a bank's book value. A bank's book value, however, may be an inaccurate measure of the "true" value of capital. One reason for this is that bank assets are often recorded at their historical cost and are not adjusted for fluctuations in their value.

In an effort to measure more accurately the value of a bank holding company, this study considers not only a bank holding company's book value but also its market value. Introducing a measure of the market value of capital is desirable because accounting measures of capital may inaccurately measure the "true" value of capital. If the market value of capital reflects additional information about the "true" value, then including the market value should lead to improved measurement of the importance of capital in the lending process.

I find that both the market and book measures of capital help explain variation in loan growth across holding companies, with a positive relationship between both

¹ Bernanke and Lown (1991), Gunther, Lown, and Robinson (1991), and Samolyk (1991) investigate "credit crunches."

² See Bernanke and Gertler (1987).

³ Bernanke and Lown (1991), Clair and Yeats (1991), and Peek and Rosengren (1991) consider the effect of bank capital on bank lending.

capital measures and loan growth. This suggests that the market value of capital contains information about the "true" value of capital that is not included in accounting measures.

Determinants of Lending

There are many determinants of lending. The primary focus in this article is on bank capital, but other potentially important determinants include the availability of internally generated funds and economic conditions.

Bank capital. I emphasize two channels through which a bank's capital may influence its lending. First, a bank's capital will influence its attractiveness to uninsured depositors because it serves as a cushion protecting depositors from losses if the value of the bank's assets should decline. Thus, because a bank's capital makes it easier for the bank to obtain funds for increased lending, I expect a positive relationship between a bank's capital and its loan growth.⁴

The existence of deposit insurance weakens the link between a bank's capital and its ability to attract deposits; when depositors are fully insured, they are unconcerned with the soundness of their bank, and therefore, the link between bank capital and the ability of the bank to raise funds is

weakened. Some linkage may remain, however, since the ability to raise funds from uninsured sources will continue to be influenced by the probability of bank failure and hence the amount of capital available to the bank.^{5,6}

The second channel through which bank capital may affect lending is through its influence on regulatory treatment. Just as capital serves as a cushion to protect uninsured depositors from losses, it also helps protect the bank insurance fund from losses. As a result, regulators are concerned about the adequacy of bank capital. Furthermore, because increased capital reduces risk to the bank insurance fund, increased capital allows a bank increased flexibility in its operations; as a bank's capital increases, its freedom to extend loans increases as well.

Because of the influence of a bank holding company's capital on its relationships with both regulators and uninsured creditors, bank holding company capital will also influence its extension of loans. Previous papers have typically focused on accounting values of capital in investigating the relationship between capital and lending. This article builds on previous studies by including the market value of capital in the examination of the impact of capital on lending. (The market value of a bank holding company's capital is computed by multiplying the number of its shares of common stock outstanding by the price per share.)

I include a measure of the market value of capital because accounting measures of capital may be flawed, and therefore may not contain all of the information relevant to the relationship between bank capital and lending. For example, book measures of capital are typically computed with assets valued at their historical cost, regardless of subsequent changes in their values. Using flawed accounting measures of capital to assess the role of capital in the lending process may result in inaccurate measurement of the relationship between capital and lending.

Internal funds. As described above, one of the benefits of increased capital is the

⁴ See Bernanke and Gertler (1989) and Moore (forthcoming) for theoretical models stressing the importance of capital in borrower-lender relationships and Bernanke and Gertler (1987) for a model stressing the importance of capital in bank-depositor relationships in particular.

⁵ Short and Gunther (1988) found that among Texas banks and thrifts in the late 1980s, an institution's deposit cost was inversely related to the institution's capital ratio.

⁶ Uninsured sources of funds include large certificates of deposit and interbank loans. These sources are at least partially uninsured at a bank if there is some uncertainty about whether the bank is covered by the "too big to fail" doctrine.

reduction in the cost of obtaining outside funds. The cost of attracting these funds, however, may remain above the cost of internal funds; in this case, the availability of internal funds will influence the bank holding company's growth. A large flow of internal funds will make it less costly for the bank to expand lending, and hence, I expect a positive relationship between the availability of internal funds and loan growth.

Economic conditions. In addition to measures of financial condition, lending may also be affected by economic conditions that influence banks' perception of the general level of credit risk and borrowers' demand for credit. Strong economic activity in a bank's market area will increase the demand for credit by the bank's borrowers and will also increase the bank's willingness to lend. I therefore expect a positive relationship between economic activity and loan growth.

The rest of this article focuses on the relationship between capital and loan growth. For a full analysis of the effects of capital, internal funds, and economic conditions on loan growth, see Moore (1992), where the relative impact of each determinant is assessed simultaneously.

Relationship Between Book and Market Values of Capital

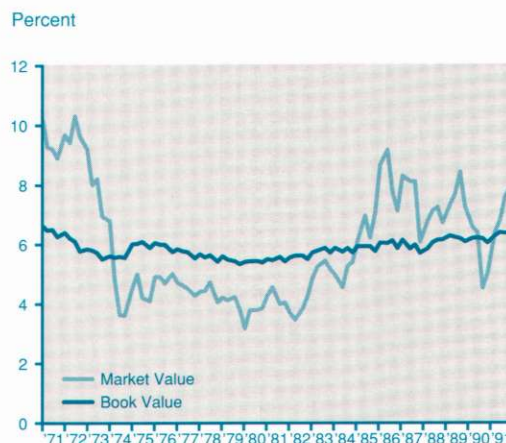
To assess the influence of market value capital on bank lending, it is necessary to limit the sample to bank holding companies with publicly traded stock. The data for this article were obtained from bank call reports, bank holding company call reports, and the COMPUSTAT data base. The sample includes observations on 124 bank holding companies and their subsidiary banks. The data were drawn from the fourth quarters of 1990 and 1991, allowing me to explain loan growth during 1991.

Before empirically assessing the association of both book value and market value capital with loan growth, it is useful to examine the capital measures themselves. Both the book and market capital-to-asset

ratios were rising, on average, during my sample period. From the end of 1990 to the end of 1991, the ratio of the book value of capital to assets rose from 6.39 percent to 6.53 percent, while the ratio of the market value of capital to assets rose from 5.44 percent to 8.12 percent. The average of these ratios over time is shown in Chart 1. While the ratios are similar on average (5.87 percent for market capital/assets and 6.01 percent for book capital to assets), it is apparent from the chart that the market measure is considerably more volatile than the book measure. This suggests that the market measure may be more sensitive than the book measure to events that change the "true" value of bank holding company capital.

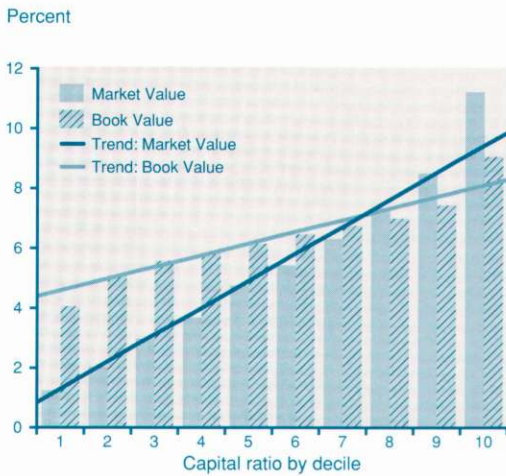
Another way to compare the book and market capital-to-asset ratios is to look at the ratios across holding companies, which is the approach I emphasize. Chart 2 shows median book and market capital-to-asset ratios by decile for bank holding companies for year-end 1990. The chart reveals that there is greater dispersion across holding companies in market values than in book values, as indicated by the greater slope of the trend line for market ratios than for book ratios.

Chart 1
Average Capital-to-Asset Ratios



SOURCE OF PRIMARY DATA: COMPUSTAT data base.

Chart 2
Median Capital-to-Asset Ratios
by Decile, 1990:4



SOURCE OF PRIMARY DATA: COMPUSTAT data base.

Finally, although book value exhibits less variation than market value, I would like to know what sort of relationship, if any, exists between the two measures. To investigate the relationship, I use the following procedure: bank holding companies' book and market capital-to-asset ratios are classified as low, medium, or high, where the classifications are formed by sorting the companies according to their capital-to-asset ratios and then dividing the sample of holding companies into thirds. For example, the holding companies classified as having low market capital-to-asset ratios are those that are in the bottom third of holding companies as ranked by market capital-to-asset ratios.

Chart 3 shows the relationship between book and market capital-to-asset ratios, using the above classifications. First, there is a positive association between book and market measures; among the forty-one holding companies that ranked low for market value, 63.4 percent also ranked low for book value. Among the forty-two hold-

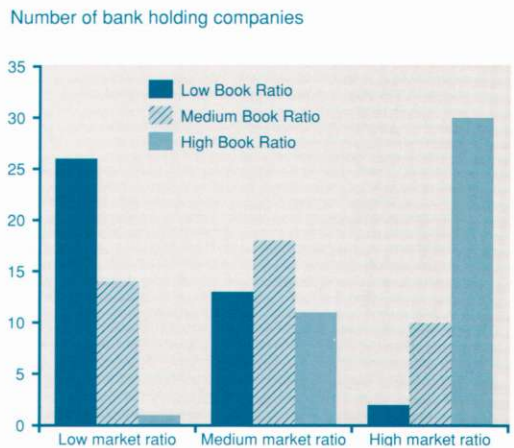
ing companies that ranked medium for market value, 42.9 percent also ranked medium for book value. And among the forty-two holding companies ranked high for market value, 71.4 percent also ranked high for book value.

Although the two capital ratios tend to have a positive relationship with each other, there are some discrepancies between the two measures. For example, among the forty-one holding companies with low book value, fifteen (or 35.8 percent) have either medium or high market value. Hence, while the two measures are correlated, the correlation is far from perfect, suggesting that each may have an independent effect on loan growth.

Empirical Results: What Explains Variation in Loan Growth?

While lending volume declined slightly on average for the sample of bank holding companies, there was a great deal of dispersion in loan growth rates. Chart 4 shows the median rate of loan growth between the fourth quarter of 1990 and the fourth quarter of 1991 by decile.⁷ Median loan growth was -25.3 percent in the lowest

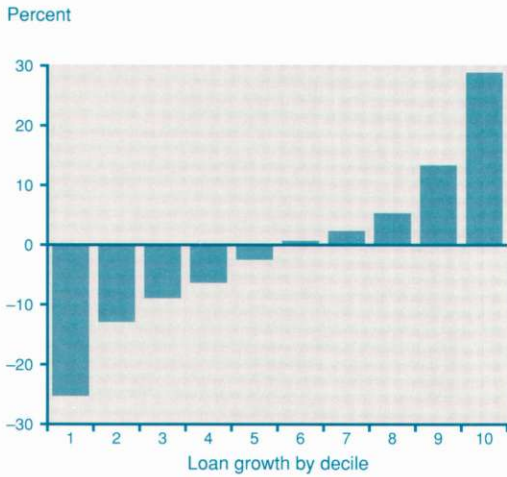
Chart 3
Distribution of Capital-to-Asset Ratios
Book and Market Measures, 1990:4



SOURCE OF PRIMARY DATA: COMPUSTAT data base.

⁷ Loans refers to the sum of loans and leases.

Chart 4
Median Loan Growth by Decile
Bank Holding Companies, 1990:4–1991:4



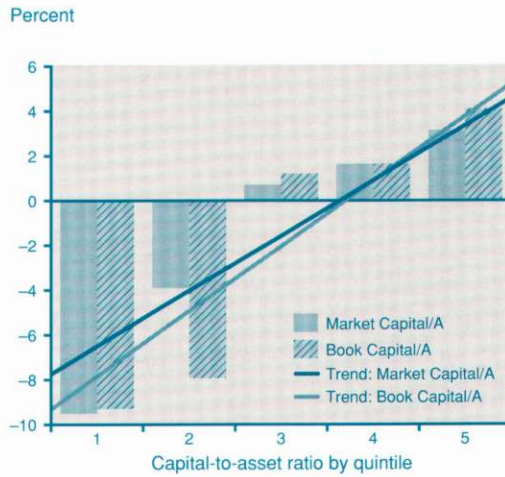
SOURCE OF PRIMARY DATA: COMPUSTAT data base.

decile, compared with 28.9 percent in the highest decile. I now turn to our assessment of the ability of book and market measures of bank capital to explain the variation in the rate of loan growth across bank holding companies.

Basic approach. My basic approach for investigating the effect of an explanatory variable on loan growth is to divide the holding companies into quintiles based on their values of the explanatory variable. The relationship between the explanatory variable and loan growth is then revealed by the pattern in median loan growth across quintiles.⁸

I apply the basic approach to both the book and market capital-to-asset ratios and show the results in Chart 5. As this chart shows, both capital measures have a positive relationship with loan growth; i.e., median loan growth is higher in the higher capital ratio quintiles than in the lower capital ratio quintiles. Within the lowest capital quintiles, loans declined by roughly 9 percent, while within the highest quintiles, lending increased by 3 percent to 4 percent. In addition to showing the median loan growth rates across capital ratio quin-

Chart 5
Median Loan Growth by Book and Market
Capital-to-Asset Quintiles



SOURCE OF PRIMARY DATA: COMPUSTAT data base.

tiles, the chart also displays trend lines showing the effect of moving across quintiles. Both the trend line for the market measure and the trend line for the book measure show the positive relationship between capital ratios and loan growth rates. These results are consistent with my prediction.⁹ I expected the capital measures to have a positive effect on loan growth. Poorly capitalized bank holding companies will find it difficult to grow, due to regulatory scrutiny or difficulty in raising funds via uninsured sources, while well-capitalized bank holding companies will be able to grow, due to more favorable regulatory treatment or greater ability to raise funds via uninsured sources.

⁸ The results obtained with this methodology are confirmed via econometric analysis in Moore (1992). The results reported there are qualitatively identical to those reported here.

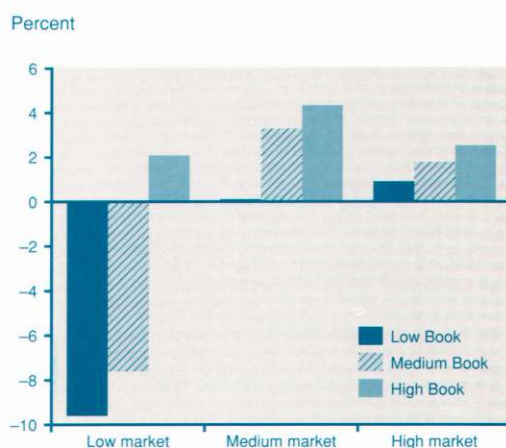
⁹ The result that loan growth is positively related to the book value of the capital-to-asset ratio is consistent with the results in Bernanke and Lown (1991), Clair and Yeats (1991), Klemme and Robinson (1992), and Peek and Rosengren (1991).

In addition to having positive slopes, the two trend lines appear nearly identical, leading one to wonder whether the two capital ratios are really saying the same thing; i.e., is there independent information within each capital measure, or is knowing one of them just as useful as knowing both of them when explaining loan growth rates?

Enhanced approach. To address the question of whether there is independent information within the two capital measures, I employ a slightly different method of analysis. Bank holding companies' book and market capital-to-asset ratios are classified as low, medium, or high, using the same classification method as was used in Chart 3. I then examine median loan growth rates among the resulting nine categories of bank holding companies. Arranging the data as in Chart 6 allows me to hold one measure of the capital-to-asset ratio roughly constant and then see whether the median loan growth rate varies when moving across the other measure of the capital-to-asset ratio.

This technique reveals that there is independent information in the book and market capital-to-asset ratios.¹⁰ First, consider the holding companies with low book capital-to-asset ratios; these are shown in dark blue in Chart 6. Among these holding companies, moving to the right across the chart shows how loan growth changes when moving into higher market capital-to-asset ratios; loan growth rises from -9.60 percent in the low market capital-to-asset ratio subgroup, to 0.08 percent in the medium market capital-to-asset ratio subgroup, and to 0.91 percent in the high market capital-to-asset ratio subgroup. Hence, within the low book capital-to-asset ratio group, moving to higher market capital-to-asset ratio categories is associated with higher rates of loan growth, especially when moving from the low market capital-to-asset ratio subgroup to the medium market capital-to-asset subgroup. This general pattern can also be seen for the holding com-

Chart 6
Median Loan Growth by Book and Market Capital-to-Asset Ratio Categories



SOURCE OF PRIMARY DATA: COMPUSTAT data base.

panies with medium and high book capital-to-asset ratios, reinforcing the conclusion that the market value of the capital-to-asset ratio has a positive influence on loan growth, even after controlling for the influence of the book capital-to-asset ratio.

Another way to analyze Chart 6 is to look at the behavior of loan growth across book capital-to-asset ratio categories, holding the market capital-to-asset ratio category fixed. Among bank holding companies in the low market capital-to-asset ratio category (the group on the left side of Chart 6), moving from the left to the right of the group shows that median loan growth rates are higher as the book value capital-to-asset ratio rises. This trend can also be seen for the holding companies with medium and high capital-to-asset ratios, which shows that the book capital-to-asset ratio has a positive influence on loan growth independent of the influence of the market capital-to-asset ratio. Again, this supports the conclusion of independent information in the book and market capital-to-asset ratios.

These results suggest that the market's valuation of a bank holding company's capital contains useful information regarding the company's ability to grow. This

¹⁰ Moore (1992) obtains similar results using a regression approach.

information is not contained in the book value, and thus, including this information may better reflect the "true" value of capital.

Conclusion

I examine the influence of bank holding company capital on loan growth and find that the book value of a bank holding company's capital-to-asset ratio has a positive relationship with loan growth. In addition, I include a measure of the market value of capital in an effort to improve the measurement of the value of a bank holding company's capital. If an accounting system inaccurately measures the "true" value of bank capital, and if the market is able—at least in part—to see through the veil of accounting, then the market's valuation of a bank will contain information about the holding company's value not reflected in the accounting valuation. I find that the market value of a bank holding company's capital-to-asset ratio also has a positive relationship with loan growth. These results are consistent with the view that a bank holding company's market value reflects information about its value that is not captured in accounting measures.

My findings suggest that an adverse shock to a bank holding company's capital, measured either in book or market terms, is likely to impair the company's lending capacity. The importance of capital that I have identified at individual bank holding companies suggests that if a shock hits a region's bank holding companies simultaneously, then credit availability within the region may be adversely affected, which then could lead to a reduction in economic activity within the region. The possibility of such developments may lead a state whose banking industry is crippled by insufficient capital to seek additional capital by opening its borders to allow entry by out-of-state bank holding companies. Consistent with this view, Gunther (1992) provides evidence pointing to a positive relationship between regional banking difficulties and the openness of recently adopted interstate banking laws. Such reductions in regulatory impediments to capital mobility should improve the allocation of capital in banking by allowing banking organizations to respond more readily to differences in opportunities across regions.

References

- Bernanke, Ben S. (1983), "Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression," *American Economic Review* 73 (June): 257–76.
- , and Mark Gertler (1989), "Agency Costs, Net Worth, and Business Fluctuations," *American Economic Review* 79 (March): 14–31.
- , and ——— (1987), "Banking and Macroeconomic Equilibrium," in *New Approaches to Monetary Economics*, ed. William A. Barnett and Kenneth J. Singleton (New York: Cambridge University Press), 89–111.
- , and Cara S. Lown (1991), "The Credit Crunch," *Brookings Papers on Economic Activity*, no. 2: 205–47.
- Clair, Robert T., and Kevin Yeats (1991), "Bank Capital and its Relationship to the Credit Shortage in Texas," unpublished manuscript.
- Diamond, Douglas W. (1984), "Financial Intermediation and Delegated Monitoring," *Review of Economic Studies* 51 (July): 393–414.
- Gunther, Jeffery W. (1992), "The Movement Toward Nationwide Banking: Assessing the Role of Regional Banking Difficulties," Federal Reserve Bank of Dallas *Financial Industry Studies*, this issue.
- , Cara S. Lown, and Kenneth J. Robinson (1991), "Bank Credit and Economic Activity: Evidence from the Texas Banking Decline," unpublished manuscript.
- Klemme, Kelly, and Kenneth J. Robinson (1992), "The Transition to Healthier Banks: Has Money Growth Been Affected?" *Financial Industry Issues*, Federal Reserve Bank of Dallas, Second Quarter.
- Moore, Robert R. (forthcoming), "Asymmetric Information, Repeated Lending, and Capital Structure," *Journal of Money, Credit and Banking*.
- (1992), "The Role of Bank Capital in Bank Loan Growth: Market and Accounting Measures," Federal Reserve Bank of Dallas Financial Industry Studies Working Paper, 3–92.
- Peek, Joe, and Eric Rosengren (1991), "The Capital Crunch: Neither a Borrower Nor a Lender Be," unpublished manuscript.
- Randall, Richard E. (1989), "Can the Market Evaluate Asset Quality Exposure in Banks?" Federal Reserve Bank of Boston *New England Economic Review*, July/August, 3–24.
- Samolyk, Katherine A. (1991), "A Regional Perspective on the Credit View," Federal Reserve Bank of Cleveland *Economic Review* 27 (Second Quarter): 27–38.
- Short, Genie D., and Jeffery W. Gunther (1988), "The Texas Thrift Situation: Implications for the Texas Financial Industry," Federal Reserve Bank of Dallas *Financial Industry Studies*, September, 1–11.
- Williamson, Stephen D. (1987), "Financial Intermediation, Business Failures, and Real Business Cycles," *Journal of Political Economy* 95 (December): 1196–216.
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