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## **COMMERCIAL BANKS' RESPONSE TO COSTLY DEPOSITS IN A DEREGULATED ENVIRONMENT**

### **Abstract**

The study examines balance sheet changes at Texas commercial banks following the 1980 bank deregulation. A comparison of selected deposit and asset variables for 1978 (pre-deregulation) and 1987 (post-deregulation) reveals a rapid increase in costly deposits and a decline in the proportion of loans in general, and agricultural loans in particular, relative to total bank assets. Although a weak Texas economy during this time period contributed to the observed asset reallocation, banks were also responding to the increased deposit costs and interest rate volatility following deregulation. This conclusion is consistent with previous findings cited in the study.

*Key Words:* Commercial Banks; Agricultural Loans; Bank Deregulation

# **COMMERCIAL BANKS' RESPONSE TO COSTLY DEPOSITS IN A DEREGULATED ENVIRONMENT**

## **Introduction**

Commercial banks have experienced a high and more volatile cost of funds following the elimination of Regulation Q in 1980. To compensate for the higher and riskier cost of funds, banks have actively sought ways to remain profitable. Their response has included cost control measures, portfolio adjustments, adjustable loan pricing, and a search for other sources of revenue. Several studies have examined the effect of deregulation on bank profitability, but little work has been done on the effect of deregulation on commercial bank asset allocation.

Moreover, the few studies found in the agricultural economics literature that have looked at the relationship between deposit structure and loan portfolios used pre-1980 data, i.e., before deregulation (Barkley et al.; Barry and Pepper) and/or limited their analysis to agricultural banks (Barry and Pepper). However, nonagricultural banks that hold more than \$2 million in farm loans are the most important single bank group financing agriculture today and their importance is increasing (Leatham and Hopkin). Thus, there is a need to extend the analysis to a broader set of commercial banks. There is also a need to extend the analysis to the post-deregulation era because commercial banks have switched from demand deposits to interest bearing deposits since deregulation, which has increased the cost of their liabilities (Keely and Zimmermann). This has been exacerbated by the increased interest rate volatility since deregulation and has a potential impact on bank asset allocation behavior. Thus, there is need to re-visit the issue of asset portfolio structure in a post-deregulation environment.

The purpose of this study is to assess changes in deposit and asset composition at Texas commercial banks after deregulation. This study will help academicians, bankers, and public policy makers understand the likely impact of commercial bank deregulation on agricultural credit. Although the data used in the study are unique to Texas, the inferences drawn can be extended to commercial banks in the rest of the United States. Federal Deposit Insurance Corporation (FDIC) call reports on condition and income were used to obtain balance sheet information for banks. The study examined changes in the means of selected deposit and asset categories, all measured as proportions of total deposits and assets,

respectively, to test for possible shifts in the composition of these categories between 1978 (pre-deregulation) and 1987 (post deregulation). Separate tests were conducted for rural versus urban banks, and independent banks versus banks affiliated with multi-bank holding companies.

## **A Review of the Literature**

During the 1930s, Congress mandated interest rate ceilings on certain types of deposits, a regulation that is commonly called Regulation Q. However, these ceilings were eliminated under the Depository Institutions Deregulation and Monetary Control Act (DIDMCA) of March 1980.<sup>1</sup> With deregulation, the deposit composition of banks started changing dramatically.<sup>2</sup> The most notable changes were (a) the switch from small time deposits (i.e., time deposits less than \$100,000) to MMDAs, which shortened the maturity of the retail deposits held by commercial banks, and (b) the switch from demand deposits to interest bearing deposits, which increased banks' cost of funds. Some studies have shown that banks reacted to the resulting decline in the spread between the rates received on interest earning assets and the rates paid on their liabilities by increasing the use of adjustable-rate loans, and shortening loan maturities.

Brown, for example, presents results of a survey in which she studied the management practices of community banks (assets valued at \$25m - \$175m) that had continued to be profitable during the early stages of deregulation (1979 - 1981). The study's goal was to determine what strategies these banks were using and what they believed to be the key to their continued profitability. Variable- or adjustable-rate loans were the high-performance banks' favorite way of dealing with interest-rate risk. Bankers also considered short maturities important, on both loans and investments, because it also provides more liquidity and flexibility.

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<sup>1</sup> This was followed by the passage of another law, the Garn-St Germain Depository Institutions Act of 1982. The provisions of this act may be viewed in some respects as dealing with the problems that the 1980 legislation had not resolved (Cooper and Fraser).

<sup>2</sup> For example, there was tremendous growth in the money market deposit account (MMDAs), which grew to over \$300 billion (15 percent of total deposits) within three months after their introduction on December 14, 1982 (Keely and Zimmermann). This inflow of money into MMDAs came from different sources: small time deposits, large certificates of deposit, and from money market mutual funds (MMMFs). The MMDA allowed small savers to earn a higher return on deposits with easy access to their money.

Some have argued that changes in the deposit composition and the resulting increase in the cost of funds can indirectly affect a bank's credit risk by forcing it to reduce asset quality. Koch, for example, argues that banks begin to experience an increase in their cost of funds, as they substitute purchased funds for demand deposits. Competitive pressure makes it difficult to reprice existing high quality assets to offset this rise. Thus banks may make riskier loans at higher promised yields rather than let their interest margins deteriorate. While this strategy allows banks to maintain their margins in the near-term, loan losses typically rise later due to decline in asset quality. This effect is greater at small banks with limited opportunities to supplement earnings in other ways. Gunther (1989), for example, found that Texas banks that had a higher proportion of large certificates of deposits (high cost of funds) and a higher concentration of their lending in commercial and industrial loans (a rather risky form of investment) became more exposed to cyclical downturns in the economy and had higher failure rates.

Another (more conservative) bank reaction to diminishing spreads might involve tightening credit standards in a bid to enhance the quality of the asset portfolio. With shrinking margins due to rising costs on deposits, some banks could tighten their credit standards by excluding borrowers who previously belonged to the category of acceptable risk. By so doing, the bank enhances the overall quality of the asset portfolio, increasing the recovery rate for the entire asset portfolio. Although this move should improve on a bank's overall portfolio performance, it can lead to the diminution of loan funds to some borrowers.<sup>3</sup>

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<sup>3</sup> The expected gross return on intermediation ( $R_G$ ) can be specified as  $R_G = (R_A - C_D)$ , where  $R_A$  is the expected gross return on a portfolio of assets and  $C_D$  is the expected cost of deposits. When  $C_D$  increases (ceteris paribus),  $R_G$  decreases. One possible way to increase or halt the decline of  $R_G$  is to raise  $R_A$ . This is better explained if  $R_A$  is specified as

$$R_A = \sum_{i=1}^N \omega_i r_i \phi_i(r_i, \psi_{ij}) \quad \text{for } j = 1, \dots, n$$

where  $N$  is the number of assets in the portfolio,  $\omega_i$  is the weight of the  $i^{\text{th}}$  asset in the portfolio,  $r_i$  is the rate of interest on the  $i^{\text{th}}$  asset,  $\phi_i$  is the recovery rate (i.e., 1 minus the default rate) of the  $i^{\text{th}}$  asset,  $\psi_{ij}$  is the  $j^{\text{th}}$  parameter influencing the recovery rate on the  $i^{\text{th}}$  asset (e.g., management ability). The bank can increase  $R_A$  by pruning out some borrowers who are thought to lower  $\phi$ . However, such a move also lowers  $N$ , thus there is a cut-off point after which further reduction in  $N$  would lower  $R_A$ . This assessment is based on the assumption that banks prefer lending to their best customers (recovery rate 100%), gradually reaching down to less preferred customers. Under ideal conditions,  $r_i$  would reflect the default risk on an asset. But as previous studies have shown, farm loans tend not to be individually priced despite the varying risk that they pose to financiers. Thus, the strategy of expanding the category of acceptable risks to receive higher premiums might increase the default risk, and could result in reduced

A bank can also adjust its portfolio of assets (e.g., loans, treasury securities, federal funds sold) toward a portfolio that rapidly adjusts to changes in the market rate of interest. Hence, the bank can reduce its loan volume in favor of treasury securities and federal funds sold. For example, when Barkley, et al. regressed bank loan-to-deposit ratios against time deposits-to-total deposit ratios (and other dependent variables) for Arizona and Colorado banks using 1977 - 1980 data, the estimated coefficient had a positive and statistically significant sign. This confirmed their hypothesis that a longer term structure of liabilities permits a bank to decrease the liquidity of its assets by increasing its loan investments. Similarly, Barry and Pepper regressed bank loan-to-deposit ratios against the ratio of time deposits less than \$100,000 to total assets (and other dependent variables) for Illinois and Iowa banks using 1978 data. The estimated coefficient was also positive, although it was statistically insignificant.

This strategy of reducing the proportion of loans in the asset portfolio, in favor of securities and federal funds, lowers asset acquisition and maintenance costs in addition to enhancing the liquidity of the banking firm. However, because of their high liquidity and low default risk (particularly treasury securities) the expected return on these investments is lower. In spite of lower expected returns, some banking firms may find this the best response to the increase in interest sensitive deposits. Given this trade-off, the extent to which the banking firm will substitute treasuries and federal funds sold for loans will depend on management's risk-return preferences. Less risk averse managers will take high risk investments with the attendant risks as noted in the Gunther study cited earlier. More risk averse managers will have a larger proportion of safe assets in their portfolios.

Other opportunities for maintaining profitability might include increasing service charges for checking accounts, trust department services, and other services. Of course a bank runs the risk of jeopardizing its competitive position if other depository institutions in its market do not also raise their service charges. In addition, a bank can lower its expenses by enhancing operating efficiency through automation and advanced training of employees. This will lower its total cost, thus maintaining or boosting its net profit, without substantial changes in its portfolio management practices.

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interest revenue. Note that increasing  $r_1$  might not necessarily achieve the desired objective since this lowers the recovery parameter, rendering the outcome indeterminate.

Banks can close non-profitable branches, particularly those that were opened during the era of regulation Q as a means of attracting deposits (Flannery). There are also potential cost savings with mergers and acquisitions.

The preceding discussion identifies an array of options that banks might take to maintain and enhance their profitability in a deregulated environment. These include the increased use of adjustable-rate loans, shortening loan maturities, taking on riskier loans at higher promised yields (which increases the probability of bank failure), tightening credit standards among the more conservative institutions, increasing service charges, and lowering operating costs. It was also noted that risk averse managers may structure their asset portfolios to include a greater proportion of assets with rates that easily and quickly adjust in tandem with changes in market rates. However, little empirical work has examined the extent to which this might have occurred since deregulation. The Barkley et al., and the Barry and Pepper studies cited above used pre-deregulation data, and did not look at individual loan categories. There is a need to assess changes that have occurred in the composition of deposits at commercial banks following deregulation and the extent to which commercial bank asset portfolios reflect these changes.

### **Data and Methods**

Using Texas data, this study assessed changes in commercial bank deposit and asset variables following commercial bank deregulation of the early 1980s, to draw implications for agricultural lending. Commercial bank data for 1978 (representing the pre-deregulation period) and 1987 (representing the post-deregulation period) were used for this analysis. Commercial bank deregulation started taking place in 1980. The year 1979 was unsuitable for pre-deregulation analysis because banks may have started reacting to the anticipated legislation during that year. Thus, 1978 was considered a more appropriate year for pre-deregulation analysis. Deregulation was carried out in phases and the last phase was in 1986. Thus, 1987 was the first year after the completion of the deregulation process and was picked to represent the post-deregulation period. The following sections describe the variables used, the test statistic employed, the sample selection process, and the study limitations.



## **Variable Description**

The deposit variables used in the study included: (1) large time deposits, i.e., time deposits of \$100,000 or more, and (2) demand deposits. Large time deposits were further disaggregated into (a) large certificates of deposit, and (b) other large time deposits. Bank assets included: (1) cash, (2) securities, (3) federal funds sold and securities purchased under agreement to resell (federal funds), (4) loans, and (5) other assets. Loans were further disaggregated into (a) real estate loans, (b) agricultural production loans, (c) commercial and industrial loans, (d) household loans, and (e) other loans.

Each asset category was defined following the Condition and Income Report Tape Documentation (U.S. Dept. of Commerce). “Cash” refers not only to currency and coin in vaults, but also to cash balances due from depository institutions (which include cash items in process of collection and unposted debits), balances due from banks in foreign countries and foreign central banks, balances due from depository institutions in the U.S., and balances due from the federal reserve banks. “Securities” refers to the total book value of securities and corporate stocks excluding trading account securities. This is the total of U.S. treasury securities, U.S. government agency and corporation obligations, securities issued by states and political subdivisions in the U.S., other domestic securities (debt and equity), and foreign securities (debt and equity).

Cash and securities reflect the liquidity of the bank. However, small banks rely more heavily on cash and securities to meet liquidity needs than do large money center and regional banks. The regional banks routinely borrow in the money markets to help meet deposit outflows or to finance incremental loan demand (Koch, p. 399). This point should be considered when interpreting the results of cash and security holdings.

“Loans” refers to the aggregate gross book value of total loans before deducting valuation reserves. Loans were further categorized as: (a) loans secured by real estate, (b) loans for agricultural production and other loans to farmers, (c) commercial and industrial loans, and (d) loans to individuals for household, family, and other expenditure. These categories of major loan purposes were selected because the FDIC reported them continuously over the study period. “Other assets” were computed as total assets minus all the above categories.

## Test Statistic

A deposit and asset ratio for each of the above variables were calculated to examine changes in their relative shares after deregulation. First, a deposit ratio for each bank included in the study was obtained by dividing year-end data (for 1978 and 1987) for each deposit variable by the total deposits. Similarly, asset ratios were obtained by dividing each asset variable by the total assets. Second, the deposit and asset ratios were averaged for each of the two years, and the differences between the 1978 and 1987 means and their standard deviations were computed. Finally, the following test statistic was used to assess whether or not the difference between the mean of the  $i^{\text{th}}$  variable had significantly changed between 1978 and 1987:

$$Z_i = \frac{\bar{X}_{i,1987} - \bar{X}_{i,1978}}{\sqrt{\frac{S_{X_{i,1987}}^2}{N_{i,1987}} + \frac{S_{X_{i,1978}}^2}{N_{i,1978}}}},$$

where  $\bar{X}_i$  is the mean of the  $i^{\text{th}}$  ratio,  $S_{X_i}^2$  is its variance, and  $N_i$  is the sample size. Using this test statistic, the null hypothesis that the difference between the two means is zero was tested at the 95% confidence level.

## Sample Selection

The selection of commercial banks to be included in the study proceeded as follows. Initially, there were 1881 banks listed on the FDIC data tape. However, only 1765 banks had complete data. This sample was further reduced to 1030 banks by eliminating newly established banks. It was important to limit the final sample to those banks that were already fully “established” by December 1978 to avoid the asset and liability anomalies associated with newly established banks (NEBs). Gunther (1990) reported that NEBs have significantly higher proportions of assets in loans (mostly in commercial and industrial loans), a low proportion of liquid assets (such as U.S. government securities or federal funds sold), and a high reliance on wholesale funds (such as large certificates of deposit). However, their investment patterns typically begin to resemble those of established banks after about five years. NEBs were excluded from the study because of these unique characteristics. As a result, the 1030

banks used in the study had been in existence for at least 15 years, i.e., six years before December 1978, and were still in operation in December 1987. Using banks that had been in existence for at least 15 years also facilitated making comparisons between the same banks at two points in time, i.e., December 1978 and December 1987. It was important to use the same banks to assess whether or not changes in deposit and asset composition had occurred within the same banks.

The selected banks were grouped into two categories: rural banks, defined as banks located outside standard metropolitan statistical areas (SMSAs), and urban banks, defined as banks located inside SMSAs. Together, there were 530 rural banks, and 500 urban banks. A test for changes in means of deposit and asset variables was performed for each bank group.

Both rural and urban banks were also grouped as independent banks and banks affiliated with bank holding companies. A distinction was made between banks affiliated with a one-bank holding company (OBHC) and banks affiliated with a multi-bank holding company (MBHC). There were only four urban and nine rural banks that belonged to an OBHC in 1978 and still belonged to an OBHC in 1987. For lack of an adequate number of observations, no pre- and post-deregulation mean comparisons were performed on OBHC affiliates. Among rural banks, 195 banks remained independent over the 15-year time period, but only 44 banks that had been affiliated to MBHCs before 1978 had remained so as of December 1987.<sup>4</sup> Among urban banks, 87 remained independent and 144 remained affiliated to MBHCs during the entire period. Banks were excluded from this analysis if their status changed during the 15-year time period.

## **Other Factors**

This study looks at changes in deposit and asset composition between 1978 and 1987 to establish the extent to which changes in the deposit structure might have triggered some changes in the asset

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<sup>4</sup> The sum of independent rural banks, and rural bank holding company affiliates (i.e., banks owned by an OBHC plus MBHC affiliates) is not equal to the total number of all rural banks in the sample. Whereas a bank might have been rural and independent in 1978, it might still be rural in 1987, but no longer independent (e.g., rural, but MBHC affiliated by 1987). This bank was included in the “All Rural Banks” sub-sample, but it was not included among independent banks (since it did not remain independent) or the MBHC-affiliated banks (since it was not MBHC-affiliated in both periods).

portfolio mix at Texas commercial banks. There were several events taking place during that time period, apart from deregulation, which influenced asset allocation among Texas commercial banks.

Lower commodity prices and land prices, and higher and more volatile interest rates beginning in the early 1980s lowered farm profitability and increased farm loan delinquencies and defaults. Banks responded to the higher than normal farm loan delinquencies and defaults by reducing their farm loan portfolios. Some banks tightened credit policies in response to their lending experience and pressure from bank regulators. An increase in borrower right provisions made it more difficult for lenders to collect on delinquent loans, thus increasing the likelihood of loan losses. Also, correspondent relationships, such as participation in overlines of large farm loans, were strained as credit requirements were raised and urban banks shifted away from farm loans. There was also a poor performance of the non-farm economy in the early to mid-1980s.

All these factors influence bank asset allocation decisions. It is necessary, therefore, to disentangle the effects of deregulation from those of other events taking place during the same time period. In his study of the performance of commercial banks in the Eleventh District of the Federal Reserve System (which covers Texas, southern New Mexico, and northern Louisiana), Yeats reports that the local economy in this region started recovering in 1987. To the extent that the unfavorable economic environment could have influenced commercial bank asset allocation decisions, one would expect a movement toward previous (although not necessarily the exact) asset mixes as the farm and non-farm economy recovered. Therefore, this study assesses whether or not banks started moving toward previous asset mixes as the recovery was under way.

## **Results**

### **Deposit Composition**

The proportion of demand deposits relative to total deposits among rural banks fell drastically from 44.8% to 16.3%, a 28.5 percentage point decline between 1978 and 1987. At the same time the share of large time deposits (mostly C.D.s) increased from 9.1% to 17.7%, i.e., an increase of 8.6 percentage points (Table 1). Thus, there was a major shift from low cost deposits to high cost deposits after deregulation. Although

independent banks decreased their average holdings of demand deposits more than MBHC affiliates after deregulation, MBHC affiliates increased their average holdings of large C.D.s more than independent banks, and continued to rely more heavily on costly deposits relative to independent banks.

Similarly, there was a sharp decline in the share of demand deposits among urban bank deposits, falling from 42.5% to 18.2%, a 24.3 percentage point decline between 1978 and 1987 (Table 2). The share of large time deposits (mostly C.D.s) increased from 16.0% to 23.5%, i.e., an increase of 7.5 percentage points. Thus, as expected, there has been a shift by both rural and urban banks toward rate sensitive deposits after deregulation.

### **Bank Assets**

In addition to (and partly in response to) changes in their deposit structure, commercial banks undertook a significant asset reallocation of their portfolios during this time period. For example, the proportion of loans relative to total assets at rural banks decreased by 5.1 percentage points, whereas the proportion of securities increased by 16.2 percentage points (Table 3). These changes were even more dramatic when the analysis was conducted on independents and MBHC-affiliates separately. For instance, the share of securities in asset portfolios at independent banks was up 20.5 percentage points, but increased only 9.5 percentage points among MBHC-affiliates. On the other hand, MBHC-affiliates and independent banks reduced the share of their loan holdings by 8.8 and 6.7 percentage points, respectively. Moreover, the share of federal funds was up 11.0 percentage points among MBHC-affiliates, although the figure for independents stayed virtually unchanged at around 7%.

This asset re-allocation among rural banks could in part be a reflection of a more aggressive gap management strategy by commercial banks after deregulation, perhaps a response to increased use of costly and more rate sensitive deposits. However, some of the shift from loans to securities could also reflect a lack of suitable loan investment opportunities in Texas during the mid 1980s. As noted earlier, the Texas economy experienced some difficulties during this time period. (This is discussed below, under “Recent Developments”). The increased share of federal funds held is partly a reflection of the growth in funds transfer technology in recent years, making them a very valuable money management tool. Large banks, in particular, engage more heavily in the federal funds market as part

**Table 1.** Selected Deposit Composition of Rural Banks in Texas Before and After Deregulation  
(Proportion of Total Deposits)

Deposit Category	1978			1987			Difference <sup>a</sup>
	Median	Mean	Standard Deviation	Median	Mean	Standard Deviation	
<u>All Rural Banks, n=530</u>							
Large Time:	0.073	0.091	0.074	0.161	0.177	0.100	0.086 <sup>*</sup>
Large C.D.s	0.049	0.069	0.070	0.154	0.167	0.097	0.098 <sup>*</sup>
Other Time	0.017	0.022	0.029	0.003	0.009	0.033	-0.013 <sup>*</sup>
Demand	0.419	0.448	0.131	0.148	0.163	0.093	-0.285 <sup>*</sup>
<u>Independent Rural Banks, n = 195</u>							
Large Time:	0.061	0.080	0.068	0.150	0.156	0.087	0.076 <sup>*</sup>
Large C.D.s	0.038	0.059	0.065	0.136	0.148	0.086	0.089 <sup>*</sup>
Other Time	0.015	0.021	0.030	0.000	0.008	0.024	-0.013 <sup>*</sup>
Demand	0.445	0.481	0.156	0.150	0.178	0.126	-0.303 <sup>*</sup>
<u>Rural Banks Associated with Multi-Bank Holding Companies, n = 44</u>							
Large Time:	0.091	0.116	0.089	0.200	0.220	0.121	0.104 <sup>*</sup>
Large C.D.s	0.063	0.092	0.078	0.187	0.207	0.110	0.115 <sup>*</sup>
Other Time	0.019	0.024	0.033	0.003	0.013	0.036	-0.011
Demand	0.395	0.410	0.067	0.139	0.150	0.063	-0.260 <sup>*</sup>

<sup>a</sup> This is the difference between the mean in 1987 (after deregulation) and the mean in 1978 (before deregulation).

\* Statistically significant at the 5 percent level.

**Table 2.** Selected Deposit Composition of Urban Banks in Texas Before and After Deregulation  
(Proportion of Total Deposits)

	1978			1987			
Deposit Category	Median	Mean	Standard Deviation	Median	Mean	Standard Deviation	Difference <sup>a</sup>
<u>All Urban Banks, n = 500</u>							
Large Time:	0.132	0.160	0.117	0.223	0.235	0.119	0.075 <sup>*</sup>
Large C.D.s	0.102	0.129	0.105	0.215	0.225	0.115	0.096 <sup>*</sup>
Others Time	0.022	0.032	0.044	0.003	0.010	0.028	-0.022 <sup>*</sup>
Demand	0.421	0.425	0.087	0.173	0.182	0.061	-0.243 <sup>*</sup>
<u>Independent Urban Banks, n = 87</u>							
Large Time:	0.073	0.100	0.082	0.168	0.171	0.090	0.071 <sup>*</sup>
Large C.D.s	0.053	0.074	0.079	0.159	0.165	0.090	0.091 <sup>*</sup>
Other Time	0.020	0.025	0.028	0.003	0.006	0.009	-0.019 <sup>*</sup>
Demand	0.411	0.438	0.118	0.176	0.183	0.067	-0.255 <sup>*</sup>
<u>Urban Banks Associated with Multi-Bank Holding Companies, n = 144</u>							
Large Time:	0.189	0.207	0.126	0.301	0.304	0.111	0.097 <sup>*</sup>
Large C.D.s	0.142	0.161	0.108	0.286	0.289	0.103	0.128 <sup>*</sup>
Other Time	0.026	0.046	0.059	0.003	0.015	0.036	-0.031 <sup>*</sup>
Demand	0.427	0.431	0.068	0.169	0.182	0.068	-0.249 <sup>*</sup>

<sup>a</sup> This is the difference between the mean in 1987 (after deregulation) and the mean in 1978 (before deregulation).

\* Statistically significant at the 5 percent level.

**Table 3.** Asset Composition Among Rural Banks in Texas Before and After Deregulation (Proportion of Total Assets)

Asset Category	1978			1987			Difference <sup>a</sup>
	Median	Mean	Standard Deviation	Median	Mean	Standard Deviation	
<u>All Rural Banks, n = 530</u>							
Cash	0.121	0.134	0.051	0.095	0.122	0.088	-0.012 <sup>*</sup>
Securities	0.136	0.154	0.114	0.312	0.316	0.162	0.162 <sup>*</sup>
Federal Funds	0.039	0.054	0.055	0.056	0.081	0.095	0.027 <sup>*</sup>
Loans	0.520	0.505	0.126	0.453	0.454	0.152	-0.051 <sup>*</sup>
Other Assets	0.143	0.153	0.141	0.023	0.027	0.020	-0.126 <sup>*</sup>
<u>Independent Rural Banks, n = 195</u>							
Cash	0.121	0.134	0.050	0.103	0.130	0.094	-0.004
Securities	0.137	0.156	0.117	0.355	0.361	0.164	0.205 <sup>*</sup>
Federal Funds	0.050	0.065	0.060	0.061	0.077	0.075	0.012
Loans	0.485	0.474	0.128	0.403	0.407	0.155	-0.067 <sup>*</sup>
Other Assets	0.160	0.172	0.137	0.021	0.024	0.019	-0.148 <sup>*</sup>
<u>Rural Banks Associated with Multi-Bank Holding Companies, n = 44</u>							
Cash	0.116	0.130	0.043	0.077	0.091	0.060	-0.039 <sup>*</sup>
Securities	0.178	0.181	0.096	0.311	0.276	0.158	0.095 <sup>*</sup>
Federal Funds	0.028	0.044	0.050	0.074	0.154	0.194	0.110 <sup>*</sup>
Loans	0.567	0.541	0.115	0.456	0.453	0.129	-0.088 <sup>*</sup>
Other Assets	0.087	0.104	0.111	0.025	0.026	0.016	-0.078 <sup>*</sup>

<sup>a</sup> This is the difference between the mean in 1987 (after deregulation) and the mean in 1978 (before deregulation).

\* Statistically significant at the 5 percent level.



of their asset/liability management strategy (Koch). Thus, MBHC-affiliates (which are usually large institutions compared to independent banks) appear to rely less on securities, but more on federal funds as a source of liquidity than do independent banks.

In contrast to rural banks, urban banks held a bigger proportion of loans in their asset portfolio both before and after deregulation (55% versus 50% in 1978, and 52% versus 45% in 1987), and urban banks reduced the share of these loans by only 2.8 percentage points compared to the rural banks' reduction of 5.1 percentage points after deregulation (Tables 3 and 4). MBHC affiliates held more loans in their asset portfolio than independent banks before and after deregulation. Both reduced their loan shares by 5.0 and 6.1 percentage points, respectively.

Although urban banks held a smaller proportion of federal funds relative to their assets in 1978 than did rural banks (4.5% versus 5.4%), the situation had been reversed by 1987, with urban banks increasing the share of federal funds to 13.0%, compared to the rural banks' 8.1%. Similar to their rural counterparts, urban MBHC-affiliated banks rely less on securities and more on federal funds for liquidity management and investment than do independent banks. MBHC affiliates increased the share of federal funds by 18.1 percentage points to 22.5% after deregulation, but independent banks only increased the share of federal funds by 1.8 percentage points to 7.3% (Table 4). Thus, the federal funds market is the preferred choice of urban MBHC affiliates.

## **Loan Portfolio**

Although the proportion of loans as a whole declined in asset portfolios across all banks between 1978 and 1987, there were gainers and losers among loan categories within the same time period. For example, the proportion of agricultural loans declined by 6.2 percentage points among rural banks, but real estate loans were up by 14 percentage points over the same time period (Table 5). As expected, the growth in real estate loans was more pronounced among urban banks, up by 20.5 percentage points (Table 6). Note that urban independent banks held a higher percentage of their loan portfolio in agricultural loans compared to urban MBHC-affiliates both before and after deregulation (Table 6). As discussed earlier, these changes in loan composition do in part reflect the poor performance of Texas' farm economy over this period.

**Table 4.** Asset Composition of Urban Banks in Texas Before and After Deregulation (Proportion of Total Assets)

Asset Category	1978			1987			Difference <sup>a</sup>
	Median	Mean	Standard Deviation	Median	Mean	Standard Deviation	
<u>All Urban Banks, n = 500</u>							
Cash	0.121	0.128	0.043	0.085	0.112	0.086	-0.016 <sup>*</sup>
Securities	0.162	0.196	0.143	0.163	0.197	0.152	0.001
Federal Funds	0.032	0.045	0.048	0.071	0.130	0.156	0.085 <sup>*</sup>
Loans	0.561	0.551	0.096	0.541	0.523	0.154	-0.028 <sup>*</sup>
Other Assets	0.023	0.080	0.146	0.033	0.038	0.036	-0.042 <sup>*</sup>
<u>Independent Urban Banks, n = 87</u>							
Cash	0.117	0.126	0.043	0.088	0.109	0.064	-0.017 <sup>*</sup>
Securities	0.122	0.134	0.102	0.321	0.325	0.172	0.191 <sup>*</sup>
Federal Funds	0.040	0.055	0.054	0.056	0.073	0.085	0.018
Loans	0.526	0.519	0.102	0.469	0.458	0.156	-0.061 <sup>*</sup>
Other Assets	0.162	0.166	0.134	0.032	0.035	0.030	-0.131 <sup>*</sup>
<u>Urban Banks Associated with Multi-Bank Holding Companies, n = 144</u>							
Cash	0.126	0.130	0.041	0.075	0.112	0.102	-0.018
Securities	0.229	0.261	0.138	0.086	0.124	0.117	-0.137
Federal Funds	0.029	0.044	0.046	0.174	0.225	0.192	0.181 <sup>*</sup>
Loans	0.559	0.558	0.090	0.518	0.508	0.147	-0.050 <sup>*</sup>
Other Assets	0.021	0.007	0.137	0.027	0.031	0.024	0.024 <sup>*</sup>

<sup>a</sup> This is the difference between the mean in 1987 (after deregulation) and the mean in 1978 (before deregulation).

\* Statistically significant at the 5 percent level.

**Table 5.** Loan Composition of Rural Banks in Texas Before and After Deregulation (Proportion of Total Loans)

	1978			1987			
Loan Category	Median	Mean	Standard Deviation	Median	Mean	Standard Deviation	Difference <sup>a</sup>
<u>All Rural Banks, n = 530</u>							
Real Estate	0.208	0.216	0.130	0.359	0.356	0.168	0.140 <sup>*</sup>
Agricultural	0.168	0.226	0.199	0.095	0.164	0.180	-0.062 <sup>*</sup>
Commercial and Industrial	0.203	0.218	0.118	0.209	0.217	0.108	-0.001
Household	0.303	0.310	0.137	0.212	0.236	0.138	-0.074 <sup>*</sup>
<u>Independent Rural Banks, n = 195</u>							
Real Estate	0.203	0.204	0.130	0.330	0.329	0.162	0.125 <sup>*</sup>
Agricultural	0.180	0.237	0.198	0.111	0.173	0.175	-0.064 <sup>*</sup>
Commercial and Industrial	0.194	0.208	0.111	0.201	0.205	0.110	-0.003
Household	0.311	0.320	0.136	0.241	0.268	0.154	-0.052 <sup>*</sup>
<u>Rural Banks Associated with Multi-Bank Holding Companies, n = 44</u>							
Real Estate	0.221	0.234	0.133	0.384	0.358	0.171	0.124 <sup>*</sup>
Agricultural	0.183	0.246	0.205	0.106	0.194	0.205	-0.052 <sup>*</sup>
Commercial and Industrial	0.210	0.218	0.103	0.212	0.229	0.120	0.011
Household	0.245	0.278	0.126	0.190	0.194	0.085	-0.084 <sup>*</sup>

<sup>a</sup> This is the difference between the mean in 1987 (after deregulation) and the mean in 1978 (before deregulation).

\* Statistically significant at the 5 percent level.

**Table 6.** Loan Composition of Urban Banks in Texas Before and After Deregulation (Proportion of Total Loans)

Loan Category	1978			1987			Difference <sup>a</sup>
	Median	Mean	Standard Deviation	Median	Mean	Standard Deviation	
<u>All Urban Banks, n = 500</u>							
Real Estate	0.226	0.237	0.110	0.456	0.442	0.148	0.205 <sup>*</sup>
Agricultural	0.006	0.048	0.086	0.001	0.027	0.057	-0.021 <sup>*</sup>
Commercial and Industrial	0.292	0.300	0.143	0.250	0.264	0.119	-0.036 <sup>*</sup>
Household	0.364	0.374	0.138	0.186	0.215	0.133	-0.159 <sup>*</sup>
<u>Independent Urban Banks, n = 87</u>							
Real Estate	0.225	0.237	0.113	0.394	0.385	0.158	0.148 <sup>*</sup>
Agricultural	0.044	0.091	0.108	0.016	0.054	0.080	-0.037 <sup>*</sup>
Commercial and Industrial	0.230	0.245	0.111	0.240	0.246	0.122	0.001
Household	0.350	0.386	0.112	0.239	0.290	0.153	-0.096 <sup>*</sup>
<u>Urban Banks Associated with Multi-Bank Holding Companies, n = 144</u>							
Real Estate	0.233	0.251	0.112	0.450	0.447	0.140	0.196 <sup>*</sup>
Agricultural	0.002	0.024	0.062	0.000	0.014	0.032	-0.010
Commercial and Industrial	0.340	0.335	0.143	0.254	0.272	0.113	-0.063 <sup>*</sup>
Household	0.337	0.342	0.140	0.156	0.180	0.113	-0.162 <sup>*</sup>

<sup>a</sup> This is the difference between the mean in 1987 (after deregulation) and the mean in 1978 (before deregulation).

\* Statistically significant at the 5 percent level.

It should also be noted that a decrease in the proportion of agricultural loans in bank asset portfolios does not necessarily imply a reduction in the absolute volume of agricultural loans. Agricultural loan ratios can decline when absolute agricultural loan amounts are increasing.<sup>5</sup> What can be said here is that one can potentially have a sub-optimal growth in agricultural credit as bankers respond to different pressures, particularly those relating to the need for a new balance

between loan and non-loan investment opportunities. To the extent that this is true, a significant reduction of agricultural loans as a percentage of the total loan portfolio implies that it may be more difficult for agricultural borrowers to obtain loans they would otherwise receive.

## **Recent Developments**

As noted earlier, both the farm and non-farm sectors were facing severe financial difficulties in the early to mid-1980s. To the extent that the above asset re-allocation was a direct response to changes in the local economy, one would expect a movement toward previous (although not necessarily the same) loan levels and asset mixes after the crisis was over. As Yeats reports, the Texas economy started emerging out of recession in 1978. By using loan and asset information from Yeats' study, it was possible to demonstrate the post-1987 trend in loan to asset ratios. As this information is for all the Eleventh District commercial banks of the Federal Reserve System (i.e., Texas, northern Louisiana, southern New Mexico), it is not an exact match of the data reported in this study. Thus, only the trend is of much significance. Results show that loan ratios continued to exhibit a declining trend even after the 1987 recovery was well underway, i.e., 54.77% in 1987, 50.33% in 1988, 45.91% in 1989, and 44.58% in 1990. Based on this information, it appears that changes in bank asset allocation cannot be fully explained by the performance of the local economy. This lends credence to the proposition that other factors, such as those discussed earlier in the paper, have played, and might still be playing, a major role in influencing bank asset allocation decisions.

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<sup>5</sup> In fact, the total nominal outstanding farm debt held by commercial banks in the U.S. increased from \$34.4 billion in 1978 to \$40.7 billion in 1987 (U.S. Dept. of Agriculture). However, as information on total nation-wide bank loans (and total assets) was not available, it was not possible to judge whether or not this growth in agricultural loans was amid increasing, constant, or declining agricultural loan to total loan ratios (or total loan to total asset ratios).

## **Summary and Concluding Remarks**

Balance sheets of commercial banks in the U.S. have undergone important changes since the passage of DIDMCA in 1980. For instance, there was an increase in large time deposits held by banks and a decrease in demand deposits. Although the increase in large time deposits enhanced the stability of the deposit base by reducing fluctuations in deposit volume, it exposed banks to additional intermediation costs, as well as interest rate risk. Past literature documents a range of options that commercial banks have taken or would be likely to take in response to the increased cost of deposits and the additional interest rate risk. These include: increased use of adjustable-rate loans, shortening loan maturities, taking on riskier loans with higher promised yields, tightening credit standards by the more risk averse managers, increasing service charges, and lowering operating costs. It is also possible that risk averse managers may structure their asset portfolios more in favor of non-loan assets that have rates that quickly and easily adjust in tandem with changes in market rates. However, little empirical work has examined the extent to which this might have occurred since deregulation.

The purpose of this study was to examine changes that have occurred to commercial bank deposits since deregulation, and how this might have affected asset allocation among these banks. Results confirm findings in past literature that there have been major shifts in bank deposit structures and deposits are now weighted more heavily toward high cost deposits. Results also show that banks have decreased the share of loans in their portfolios, but increased the share of securities and federal funds. This has occurred more among rural banks than urban banks. In addition to the general reduction in the share of loans in commercial bank asset portfolios, there has also been a significant decline in agricultural production loans held by commercial banks relative to total bank loans. Several factors have contributed to this phenomenon.

This could be a reflection of a dearth of investment opportunities or a flight to safety during the study period (1978 - 1987). However, data show that there was a persistent decline in the total loan to asset ratios, even after the region's economic recovery in 1987. This discounts the flight to safety notion as the only explanation for declining loan ratios. The change in asset allocation could also be a reflection of a desire by banks to invest in assets with interest that adjusts concurrently with interest charges on bank deposits. Increased use of federal funds could also reflect the growth in funds transfer technology in recent years, which large banks in particular find to be a very valuable money management tool.

Bank asset allocation as a response to changes in the deposit structure may have major implications for agriculture. This could mean, for example, that some farmers, who before deregulation may have obtained a loan, *ceteris paribus*, may not be extended credit in a deregulated environment. Banks may seek to improve the quality of their loan portfolios by eliminating what was previously acceptable risk, investing more in securities, and participating more in the federal funds market.

Although this study shows that changes in deposit structures at commercial banks could adversely affect agricultural lending, it does not reveal the extent to which this might have occurred, partly because of other factors involved. However, to the extent that banks consider the cost of funds and interest rate variability in their investment decisions, there is a need for understanding whether or not deregulation will lead to a diminution of funds to the agricultural sector, an increase in the price of funds to agricultural borrowers, or less accessibility of credit to farmers leading to a highly segregated market. These issues need to be further addressed in future research.

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