

Federal Reserve Membership and the Role of Nonmember Bank Reserve Requirements

By Carl M. Gambs

Recent withdrawals of a large number of banks from the Federal Reserve System have focused attention on the importance of the reserve requirements imposed by the Federal Reserve on member banks.¹ Since withdrawal of a bank from the Federal Reserve System automatically makes it subject to state reserve requirements, these requirements are also important in determining whether banks choose to belong to the Federal Reserve System. Nonmember banks in all states but Illinois are subject to reserve requirements. However, state requirements are generally lower than those set by the Federal Reserve and allow nonmember banks to hold reserve balances in interest-earning securities or in service-earning deposits with correspondent banks.

This article examines the role of reserve requirements on both Federal Reserve member and nonmember bank deposits, with particular attention to the Tenth Federal Reserve District.² The first section considers the purpose and importance of reserve requirements in general. The next section compares the level of member bank reserve requirements to the level of nonmember reserve requirements in the Tenth District states. Finally, evidence is examined on the extent that state reserve requirements affect the cash reserve holdings of nonmember banks.

PURPOSE AND IMPORTANCE OF RESERVE REQUIREMENTS

Three different roles for reserve requirements have been suggested. One role of reserve requirements, it originally was thought, is to help ensure the liquidity and safety of banks. Another role, it is contended, is that requirements serve as a tax on banks. However, contemporary analysts generally emphasize the role that reserve requirements play in facilitating monetary control.

¹ At least 41 member banks have left the System in every year since 1968. In 1977, 69 banks withdrew, the second highest number on record, and 37 banks left in the first half of 1978. Furthermore, while earlier withdrawals were almost entirely by very small banks, 15 of the banks withdrawing in 1977 had deposits of more than \$100 million. See Board of Governors of the Federal Reserve System, "The Burden of Federal Reserve Membership, NOW Accounts, and the Payment of Interest on Reserves," June 1977; Robert E. Knight, "Comparative Burdens of Federal Reserve Member and Nonmember Banks," *Monthly Review*, Federal Reserve Bank of Kansas City, March 1977, pp. 3-28; and Peter S. Rose, "Banker Attitudes Toward the Federal Reserve System: Survey Results," *Journal of Bank Research*, 8 (Summer 1977), pp. 77-84.

² The Tenth District includes Colorado, Kansas, Nebraska, Wyoming, most of Oklahoma, northern New Mexico, and 43 counties in western Missouri.

Reserve Requirements to Ensure Bank Liquidity and Safety

Historically, the introduction of reserve requirements was motivated by the belief that a bank's required reserves would provide liquidity in the event of an unexpected outflow of deposits and would protect depositors in the event of the insolvency of the bank.³ However, under the fractional reserve systems used by both the Federal Reserve and the states, required reserves do not contribute much to liquidity and safety. Suppose, for example, that a state imposed a 10 per cent reserve requirement on demand deposits. A \$10 deposit outflow would reduce a bank's cash assets by \$10, but only \$1 would come from required reserves. Thus, most of the liquidity to meet the outflow must come from other sources.⁴

Early proponents of reserve requirements also believed that required reserves would provide protection to depositors in the event of insolvency. This belief confuses the role of capital—which allows liabilities to be met in the event of a decline in asset values—and that of reserves, which are simply one type of asset. For example, the only default protection provided by a 10 per cent reserve requirement is a guarantee that the institution will have on hand \$1 for every \$10 of deposits. Only if required cash reserves were equal to 100 per cent of deposits would they protect depositors.

³ For a discussion of pre-Civil War state reserve requirements, see Bray Hammond, "Banking Before the Civil War," pp. 1-14, in Deane Carson, ed., *Banking and Monetary Studies* (Homewood, Ill.: Irwin, 1963).

⁴ Required reserves do provide liquidity for very brief periods. The Federal Reserve and most states use a system of averaging reserves and deposits over a period of one or more weeks. Under this system, reserves can be used as a source of liquidity for a very brief period of time, as long as the reserve requirements are met on average over the period.

Thus, cash reserve requirements do not contribute much to bank liquidity or to the protection of depositors. Moreover, to the very limited extent that required reserves serve these functions, reserves could be held in the form of liquid interest-bearing assets, so that cash requirements would be unnecessary.⁵

Reserve Requirements as a "Tax" on Banks

A further role of reserve requirements, it is contended, is that they serve as a tax on banks. To the extent that member banks hold higher levels of noninterest-bearing reserve assets than they otherwise would, reserve requirements on member banks are effectively a tax on these banks that provides revenue to the Federal Government.⁶ The tax on banks is equal to the interest that would otherwise have been earned on reserve assets. The Government revenue arises from the interest earned by the Federal Reserve on securities acquired to support member bank reserves. Suppose, for example, the Federal Reserve increased bank reserve requirements but did not want to induce a change in the money supply. In this case, the System would purchase securities in the open

⁵ The fact that required reserves do not serve as a source of liquidity in the event of a deposit outflow has been widely recognized at least since the beginning of this century. Nevertheless, a survey of state banking commissioners in 1952 yielded the near unanimous view that the primary function of reserve requirements was to serve as a source of liquidity. Joint Committee on the Economic Report, 82d Cong., 2d Sess., *Monetary Policy and the Management of the Public Debt, Replies to Questions and Other Material for the Use of the Subcommittee on General Credit Control and Debt Management* (Washington: Government Printing Office, 1952), pp. 978-83.

⁶ There is an old controversy as to whether the Federal Reserve earns interest on funds deposited with it by member banks, or earns interest on funds created by its own open market operations. The answer is clearly both, with the controversy being akin to a discussion of which side of a pair of scissors cuts.

market to provide enough new reserves to support an unchanged level of deposits. To meet the higher requirements, member banks would reduce their interest-earning assets and build up their noninterest-earning reserve assets.' The final result would be higher earnings for the Federal Reserve and lower earnings for commercial banks. Since Federal Reserve profits are remitted to the **U.S. Treasury**, the impact of higher reserve requirements amounts to increasing taxes on member banks.

These "taxes" apply only to member banks. Reserve requirements applied to nonmember banks by the various states provide no revenue to state treasuries or to the Federal Government, with the minor exception of a few states that require some fraction of reserves to be held in vault **cash**.⁷ While state reserve requirements do not generate "tax" revenues, they may still be burdensome to nonmember banks to the extent that banks hold more reserves than would otherwise be the case. However, because many of the reserve assets held by nonmember banks provide a return either in interest income or in services, the burden is generally less for nonmember banks than for member banks with the same level of reserve requirements.

Reserve Requirements as a Monetary Policy Tool

The primary purpose of reserve requirements imposed on member banks by the Federal

Reserve is to facilitate monetary control. Because member banks must hold reserves behind deposits, the total quantity of deposits that can be issued is limited by the supply of reserves in the banking system. Thus, the Federal Reserve can influence the quantity of deposits and the money supply by changing the quantity of reserves, normally through open market operations.⁹

The Federal Reserve can also influence the money supply by changing the level of reserve requirements. For example, an increase in reserve requirements will lead to a reduction in the total volume of deposits, unless the total quantity of reserves is simultaneously increased. The reduction in deposits would occur because the reserves available in the banking system would not be sufficient to support the existing level of deposits, and banks would need to contract their size until the reserve deficiency was eliminated.¹⁰

Some observers argue that reserve requirements are not important for monetary policy because they are infrequently changed. However, the frequency with which reserve requirements are changed is not important for determining whether requirements facilitate monetary control. Requirements facilitate control if they make the relationship between the level of deposits and the level of bank reserves more predictable than it would be in the absence of reserve requirements. However, if banks would hold predictable quantities of reserves in the absence of reserve requirements,

⁷ For a discussion of reserve requirements as taxes, see William G. Dewald, "Linking Required Reserves Reform to the Correspondent Banking System," in *Proceedings of a Conference on Bank Structure and Competition*, Federal Reserve Bank of Chicago, April 27-28, 1978.

⁸ The essential difference between member and nonmember banks here is that member banks hold liabilities of the Federal Reserve which, in turn, holds interest-earning assets and turns the earnings over to the U.S. Treasury. Vault cash is the only Federal Reserve liability held by nonmembers.

⁹ J. A. Cacy, "Reserve Requirements and Monetary Control," *Monthly Review*, Federal Reserve Bank of Kansas City (May 1976), pp. 3-13.

¹⁰ Assuming that banks were not holding large amounts of excess reserves—that is, reserves greater than needed to meet requirements—prior to the increase in reserve requirements.

required reserves would not be necessary for monetary control.¹¹

The use of reserve requirements as a monetary control device applies only to member banks. Reserve requirements of nonmember banks do not serve a direct monetary control function because in general state requirements can be met by holding assets that are not under the direct control of the Federal Reserve—such as balances at other banks and Government securities.

Role of State Reserve Requirements

Of the three listed purposes of reserve requirements, two do not apply to state reserve requirements, *i.e.*, their use for monetary control and their use as a bank tax. The third **purpose—a source of liquidity and safety**—is of minor importance. Thus, it might be argued that state reserve requirements have virtually no function.

However, state reserve requirements may indirectly play a role in facilitating monetary control. If state requirements encourage membership in the System, they strengthen monetary control because more members mean more deposits directly subject to Federal Reserve control. The extent to which state requirements encourage membership depends importantly on two factors. One is the level of nonmember bank reserve requirements relative to member requirements. The other is the extent that these requirements are effective that is, whether or not they actually induce banks to hold a higher level of cash assets than would otherwise be the case. The remainder of

this article will look at the level of nonmember reserve requirements in Tenth District states and examine the evidence on the effectiveness of state reserve requirements.

FEDERAL RESERVE AND TENTH DISTRICT RESERVE REQUIREMENTS: 1962-78

Both Federal Reserve and state cash reserve requirements have been lowered in recent years. State requirements, however, have been lowered more than System requirements. The relatively greater decline in state requirements has pushed them below those imposed by the Federal Reserve and has reduced the extent that state requirements serve the function of encouraging banks to become and remain members of the Federal Reserve System.

The level of state cash reserve requirements in the Tenth Federal Reserve District is shown in Table 1.¹² In Colorado, there are no cash reserve requirements, as all of the required reserves can be held in the **form** of securities. In Missouri, Nebraska, and New Mexico, the provision in state law that allows one-half of required reserves to be met with securities reduces state cash reserve requirements to levels somewhat below the requirements for member banks. In Kansas and Oklahoma, reserve requirements are approximately the same for member and nonmember banks. In Wyoming, state reserve requirements tend to be somewhat higher than the requirements for Federal Reserve members, especially for very small banks, due to the relatively high reserve requirements on time and savings deposits and on the first \$10 million of demand deposits. As

¹¹ Reserve requirements may also be unnecessary if the Federal Reserve relies on interest rates rather than bank reserves to control the money stock. See J. A. Cacy, "The Impact on Monetary Control of Reducing Reserve Requirements," Working Paper, Federal Reserve Bank of Kansas City (forthcoming).

¹² For reserve requirements in all 50 states, see R. Alton Gilbert and Jean M. Lovati, "Bank Reserve Requirements and Their Enforcement: A Comparison Across States," *Review*, Federal Reserve Bank of St. Louis, March 1978, pp. 22-32.

a result, Wyoming has the highest proportion of member banks (75 per cent as of December 31, 1977) in the nation.

The availability of a wide array of services in return for balances on deposit with correspondents increases the relative disadvantage of member banks in most Tenth District states. **Furthermore**, nonmember banks are relatively better off because they are frequently given immediate credit for transit checks deposited with correspondents, while the Federal Reserve delays granting credit for checks for up to two days, depending on the location of the bank on which the check is drawn.¹³

The generally lower level of cash reserve requirements for nonmember banks is a development of the past 15 years. (See Chart 1.) Reserve holdings have declined relative to assets for both member and nonmember banks. Holdings have dropped because reserve requirements have been reduced and because time deposits, which have lower reserve requirements than do demand deposits, have become a more important source of bank funds.¹⁴ However, the decline has been somewhat larger for nonmember than for member banks. The greater decline for nonmember banks is not due to a relatively greater increase in the importance of time and savings deposits for nonmembers; it is due instead to a larger

reduction in reserve requirements for nonmembers than for **members**.¹⁵ Table 2 illustrates the greater decline for nonmembers by showing the level of cash reserve requirements levied against the demand deposits of a hypothetical bank with exactly \$25 million in demand deposits in 1962 and in 1978. As can be seen, state reserve requirements declined sharply in many of the Tenth District states between 1962 and 1978. These declines result largely because states now allow banks to use Government securities to meet reserve requirements to a greater extent than in 1962.

The smaller reduction in member bank reserve requirements has contributed heavily to the decline in the share of Tenth District banks holding membership in the Federal Reserve System from 42.3 per cent in 1962 to 36.3 per cent in 1978. Similarly, the share of total Tenth District bank deposits held in member banks declined from 74.9 per cent in 1962 to 63.3 per cent in 1978. Additionally, the increase in interest rates over this period has meant that the cost of holding noninterest-bearing reserve balances at the Federal Reserve has increased.¹⁶

DO STATE RESERVE REQUIREMENTS MATTER?

Some observers have argued that state reserve requirements are so low that they are not effective in inducing banks to hold more

¹³ Although banks are given immediate credit for checks deposited, the account analysis performed by the correspondent will give credit only for collected balances. Robert E. Knight, "Account Analysis in Correspondent Banking," *Monthly Review*, Federal Reserve Bank of Kansas City, March 1976, pp. 11-20.

¹⁴ It has been estimated that between February 1968 and February 1977, 55.6 per cent of the decline in the ratio of required reserves to deposits at member banks was due to changes in reserve requirements and the remainder to changes in the deposit structure. Thomas D. Simpson, "The Behavior of Member Bank Required Reserve Ratios and the Effects of Board Action, 1968-77," Staff Paper No. 97 (Washington, D.C.: Board of Governors of the Federal Reserve System, July 1978), p. 20.

¹⁵ The decline in the importance of demand deposits was similar at both Tenth District member and nonmember banks over this period. Demand deposits dropped from 72.6 per cent of member bank deposits in 1962 to 42.5 per cent in 1976. At nonmember banks, demand deposits dropped from 66.3 per cent of total deposits in 1962 to 37.1 per cent in 1976.

¹⁶ See Carl M. Gambs and Robert H. Rasche, "Costs of Reserves and the Relative Size of Member and Nonmember Bank Demand Deposits," *Journal of Monetary Economics*, 4 (November 1978), pp. 715-33, for estimates of the relative importance of differential Federal Reserve and state reserve requirements and of increasing interest rates for the decline in Federal Reserve membership.

**Table 1
RESERVE REQUIREMENTS
June 30, 1978**

State	Deposits Subject to Reserve Requirements	Current Reserve Requirement Ratios	Assets Eligible to Meet Requirements			Other	
			Vault Cash	Demand Balances Due From Banks	Securities		
Federal Reserve	T Dem—CIPC—Due From	$\left\{ \begin{array}{l} 7\% \text{ first } \$2 \text{ million, plus} \\ 9\% \text{ } \$2\text{--}\$10 \text{ million, plus} \\ 11\% \text{ } \$10\text{--}\$100 \text{ million, plus} \\ 12\frac{3}{4}\% \text{ } \$100\text{--}\$400 \text{ million, plus} \\ 16\frac{1}{4}\% \text{ over } \$400 \text{ million} \end{array} \right\}$	X			FR Deposits	
	S		3%	X		FR Deposits	
	T maturing in 30-179 days		$\left\{ \begin{array}{l} 3\% \text{ first } \$5 \text{ million, plus} \\ 6\% \text{ over } \$5 \text{ million} \end{array} \right\}$	X			FR Deposits
	T maturing in 180 days to 4 years			2½% ^{1/}	X		FR Deposits
	T maturing in 4 years or more		1% ^{1/}	X			FR Deposits
Colorado ^{2/}	T Dep—US _d —SL _d —US _t —SL _t	15%	X	X ^{3/}	X ^{4/}		
Kansas ^{2/}	T Dem—US _d —SL _d	FR	X	X			
	TS—US _t —SL _t	FR	X	X			
Missouri	T Dem	FR	$\left\{ \begin{array}{l} \text{at least } 50\% \\ \text{including local CIPC} \end{array} \right\}$		$\left\{ \begin{array}{l} \\ \text{up to } 50\% \end{array} \right\}$		
	TS	3%					
Nebraska	T Dem	15%					
	TS	5%	$\left\{ \begin{array}{l} \text{at least } 50\% \end{array} \right\}$		$\left\{ \begin{array}{l} \\ \text{up to } 50\% \end{array} \right\}$		

Federal Reserve of Kansas City

**Table 1
(Continued)**

New Mexico	T Dem	12%	}	at least 50%	}	}	}
	TS	4%		Including local CIPC ^{3/}			
Oklahoma	T Dem	FR	X	X ^{3/}			CIPC ^{8/}
	TS	FR	X	X ^{3/}			CIPC ^{8/}
Wyoming ^{2/}	T Dem—US _d —SL _d	20%	}	at least 50% ^{3,9/}	}	}	}
	TS—US _t —SL _t	10%					

¹ The average of reserves on savings and other time deposits must be at least 3 per cent, the minimum specified by law.

² Exemption applies only to public deposits which are secured by pledged securities.

³ Deposits at approved depository banks.

⁴ Unpledged, negotiable direct U.S. obligations.

⁵ Up to 50 per cent of required reserves may be invested in unpledged U.S. Government obligations maturing within five years and unpledged Federal funds sold to approved depositories.

⁶ Up to one-half of reserves can be met with unpledged U.S. Government securities, at market value, or obligations of the Commodity Credit Corporation, at face value.

⁷ Direct U.S. Government obligations maturing within 100 days.

⁸ CIPC which have been received by approved depository banks.

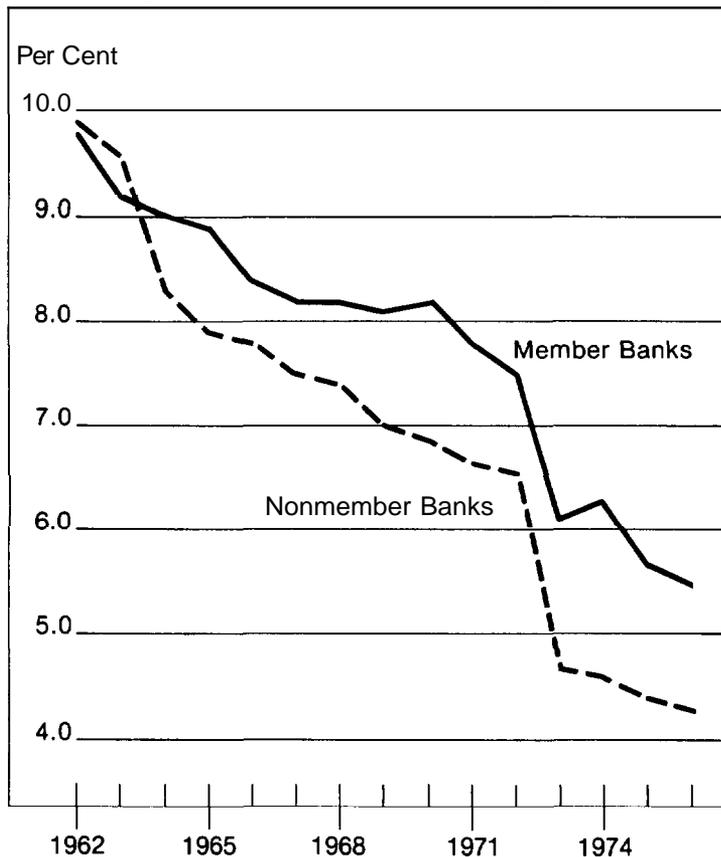
⁹ Includes CIPC.

¹⁰ Unpledged U.S. Treasury Bills.

Abbreviations in Table 1

T Dem	Total demand deposits
CIPC	Cash items in the process of collection
Due From	Demand deposits due from domestic commercial banks
FR Deposits	Member bank demand deposits at Federal Reserve Banks
S	Savings deposits
T	Time deposits
T Dep	Total deposits
US	U.S. Government demand deposits
SL _d	State and local government demand deposits
US _d	U.S. Government time deposits
SL _t	State and local government time deposits
FR _t	Same as reserve requirements of the Federal Reserve

Chart 1
REQUIRED CASH RESERVES AS A PER CENT OF TOTAL ASSETS
(Tenth Federal Reserve District)



SOURCE: Derived from data for all Tenth District member banks and sample of nonmember banks. Individual state ratios were first computed and the District composite was then obtained by weighting by total deposits in each state. For a description of the sample of nonmember banks, see Carl M. Gambs, "State Reserve Requirements and Bank Cash Assets," Research Working Paper 78-05, Federal Reserve Bank of Kansas City, August 1978, pp. 10-11.

cash assets than they would hold if they were not subject to reserve requirements. State reserve requirements can be said to be effective if a change in the level of required cash reserves leads to a change in the level of actual cash reserves. If a \$1 increase in required reserves leads to a \$1 increase in actual cash reserves, the reserve requirement is **fully effective**. If the

\$1 increase in required reserves leads to an increase in actual reserves by some amount less than \$1, the reserve requirement is partly **effective**. If state requirements are effective they provide some encouragement for banks to become or remain members of the Federal Reserve System. Moreover, the greater the degree of effectiveness, the more likely that

Table 2
REQUIRED CASH RESERVES AS A
PER CENT OF DEMAND DEPOSITS
(A Bank with \$25 Million
in Demand Deposits)

	<u>1962</u>	<u>1978</u>
Federal Reserve	12.0	10.6
State Nonmembers:		
Colorado	0.0	0.0
Kansas	12.5	10.6
Missouri	15.0	5.3
Nebraska	12.0	7.5
New Mexico	12.0	6.0
Oklahoma	15.0	10.6
Wyoming	20.0	10.0

banks will choose to be Federal Reserve members.

The effectiveness of state requirements also affects the extent to which the Federal Reserve can increase membership by lowering member bank reserve requirements. If state requirements are ineffective, the existence of the requirements does not cause banks to hold more reserves, nor does it place any burden on the banks subject to the requirements. In such a situation, if the Federal Reserve reduces requirements to reduce the relative burden of membership, the state banking authority could not make nonmember status more attractive correspondingly, as there would be no burden of state reserve requirements to reduce.

Empirical Evidence on the Effectiveness of Reserve Requirements¹⁷

Some researchers have examined the ratio of actual to required reserves to ascertain whether

¹⁷ For a discussion of previous work on the effectiveness of reserve requirements, see Gambs, "State Reserve Requirements and Bank Cash Assets," pp. 3-8.

or not a state's reserve requirements are effective. If this ratio is well above 1.0, it is argued, state reserve requirements are not effective because banks are holding more reserves than **required**.¹⁸ The logic is that if actual reserves are substantially greater than required reserves, the level of cash assets held must be determined by factors other than reserve requirements. Table 3 shows that for a sample of Tenth District nonmembers the ratios of actual to required reserves are generally well above 1.0. From these ratios alone, it might be inferred that state reserve requirements in the Tenth District are not effective. However, this inference is not necessarily valid. Many banks may want to hold excess reserves because they prefer to be highly liquid or because they want to ensure that an unexpected deposit outflow will not leave them with reserves below the required level.

Furthermore, even though the average ratio may exceed 1.0, a substantial number of banks may have a ratio near **1.0**.¹⁹ Table 3 shows that a large portion of Tenth District banks have actual reserve ratios relatively close to 1.0, *i.e.*, between 1.00 and 1.25. Reserve requirements may be effective for these banks, even if they are not for all of the banks in the sample. A mixture of some banks with partly or fully effective reserve requirements and others with ineffective reserve requirements would make

¹⁸ For an example of this approach, and for ratios similar to those in Table 3 for other states, see Board of Governors of the Federal Reserve System, "The Burden of Federal Reserve Membership, NOW Accounts, and the Payment of Interest on Reserves," Appendix A.

¹⁹ The existence of banks with a ratio of less than 1.0 does not necessarily mean that these banks were violating state reserve requirements. It may reflect the fact that these ratios were calculated using data for only one day, instead of over the entire reserve periods because data were not available to perform the latter computation.

Table 3
RATIO OF CASH ASSETS TO REQUIRED CASH RESERVES
(Per Cent of Banks in 1976)

<u>Ratio</u>	<u>Kansas</u>	<u>Missouri</u>	<u>Nebraska</u>	<u>New Mexico</u>	<u>Oklahoma</u>	<u>Wyoming</u>
<1.00	7.6	7.3	14.9	16.0	5.1	20.0
1.00–1.10	3.3	5.5	6.4	0.0	7.7	20.0
1.10–1.25	16.3	14.5	25.5	0.0	12.8	30.0
1.25–1.50	22.8	21.8	14.9	0.0	12.8	10.0
1.50–2.00	20.7	41.8	19.1	10.0	35.9	10.0
2.00–3.00	16.3	5.6	6.4	50.0	23.1	10.0
3.00–4.00	10.9	3.6	0.0	30.0	2.6	0.0
>4.00	2.2	0.0	0.0	0.0	0.0	0.0
Average	1.83	1.57	1.45	2.59	1.70	1.30

SOURCE: Calculated for a sample of 272 Tenth District banks. For a description of the sample, see Gambs, "State Reserve Requirements and Bank Cash Assets," pp. 10-11.

the ratio for all banks in a state appear to be partly effective.

The effectiveness of state reserve requirements in the Tenth District was also examined through the use of linear regression analysis.²⁰ The examination, which considered the cash holdings of 276 Tenth District nonmember banks over the 1962-76 period, concluded that state reserve requirements were partly effective. Over the period studied, a \$1 increase in required reserves, on an average, led to a \$0.39 increase in cash asset holdings. Bank cash holdings were also found to be affected by several variables other than reserve requirements. The variables include bank size, the ratio of demand deposits to total assets, and interest rates.²¹

The results of the above examination imply that state reserve requirements have an indirect role in facilitating monetary control. Banks are less likely to leave the Federal Reserve System

when there are state reserve requirements than if there were none. If there were no state reserve requirements, there would be a much greater **reduction** in the burden of reserve requirements when banks changed from member to nonmember status than is now the case.

²¹ The equation estimated by multiple regression analysis was:

$$\begin{aligned}
 \text{VDF/TA} = & 0.0121 + 11.745 \text{ 1/TA} + 0.393 \text{ CR/TA} \\
 & (1.19) \quad (3.92) \quad (8.09) \\
 & \quad \quad \quad 276 \\
 & + 0.1583 \text{ DD/TA} - 0.0017 \text{ RTB} + \sum_{i=1}^5 \alpha_i \text{BD}_i \\
 & (16.17) \quad (-3.68) \quad i = 5 \\
 & \quad \quad \quad 276 \\
 & \quad \quad \quad \sum_{i=1}^5 \alpha_i = 0
 \end{aligned}$$

$$\bar{R}^2 = .626 \quad \text{D.W.} = 1.86 \quad n = 4080$$

Where: VDF = Vault cash and due from banks
 TA = Total assets
 CR = Required cash reserves
 DD = Total demand deposits
 RTB = The rate on 3-month Treasury bills
 BD_i = The i-th bank dummy variable

The numbers in parentheses are t values.

²⁰ Gambs, "State Reserve Requirements and Bank Cash Assets."

This finding has implications for the impact of changes in member bank reserve requirements on the burden of Federal Reserve membership. In brief, the burden depends on the degree that changes in member and nonmember bank reserve requirements induce the two types of banks to change their holdings of assets. For example, suppose reserve requirements for member and nonmember banks are reduced by the same amount. If member bank requirements are fully effective, but nonmember bank requirements are not effective, the relative burden of membership will be reduced, as there will be a reduction in the cash asset holdings of members, but not of nonmembers. On the other hand, if both member and nonmember reserve requirements are fully effective, equal reductions in reserve requirements will leave the relative burden of membership unchanged—that is, state regulators can completely offset the effect of the member bank reserve reduction on the desirability of membership. The results cited here suggest that nonmember requirements are partly effective, so simultaneous reductions in member and nonmember requirements would reduce the relative burden of member banks, but not by as much as if nonmember requirements were **ineffective**. Thus, state regulators could not offset the reduced burden of member banks unless they lowered their requirements more than did the Federal Reserve.

In those states where all or part of the reserve requirements can be met with interest-bearing assets, it would be particularly difficult for state regulators to offset Federal Reserve reductions of member bank reserve requirements. If, for example, a state's nonmember banks were allowed to meet one-half of their

reserve requirements with interest-bearing assets, the state would have to lower its reserve requirements two percentage points for every one percentage point reduction in the Federal Reserve reserve requirement to get the same reduction in the level of cash requirements.

SUMMARY AND CONCLUSIONS

Federal Reserve and state reserve requirements serve very different purposes. Federal Reserve requirements are used for monetary control purposes and can also be viewed as a tax on member banks, but state requirements directly serve neither of these functions. State requirements do play an indirect role, in that they tend to **make** Federal Reserve membership more attractive than if states did not impose requirements. Neither Federal Reserve nor state reserve requirements play an important function in ensuring bank liquidity or safety, although state regulators may find the degree to which banks comply with requirements to be a useful guide to the general soundness of bank operations.

Federal Reserve requirements are much more burdensome than state requirements because they are higher and must be met with vault cash and deposits with Federal Reserve Banks, while state requirements can be met with deposits with correspondents (including uncollected funds in many cases) and in some cases with interest-bearing securities. While many banks hold more reserve assets than required to meet reserve requirements, evidence suggests that state reserve requirements, at least in the Tenth District, are partly effective. Thus, they are probably responsible for Federal **Reserve** membership being higher than it would be in the absence of state reserve requirements.