Access to FHLBank advances and the performance of thrift institutions

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Introduction and summary

The failure rate for thrifts (savings and loan associations and some savings banks) in the second half of the 1980s and early 1990s was substantially higher than in earlier decades. For example, the number of thrift failures averaged about 32 per year between 1980 and 1985, compared with about 136 per year between 1986 and 1992 (CBO, 1993). The Federal Home Loan Bank (FHLBank) System was the primary federal regulator of thrifts and was responsible for the supervision and examination of most of these failing institutions. The FHLBank System also lent funds to thrifts and became a reliable source of nondeposit funds to support the lending activities of safe and sound institutions. According to Bodfish and Theobald (1938) and as discussed in Barth and Regalia (1988), the FHLBank System lending program was not intended to "bail out" failing thrifts. However, many failed thrifts borrowed from the FHLBank System during the 1980s, and some borrowed a substantial amount several years prior to their closure. For example, of the 205 failed thrifts that were resolved (that is, liquidated or merged with regulatory assistance) in 1988, the year before Congress passed the Financial Institutions Reform, Recovery and Enforcement Act (FIRREA), 76 percent borrowed from their FHLBank three years before closure. In some cases, borrowings by these thrifts were as high as 35 percent of total assets. In their last year of operation, some of these thrifts financed about 72 percent of their total assets with FHLBank loans. By contrast, only 40 percent of their solvent counterparts borrowed from FHLBanks at the end of 1988, financing, in some cases, only 46 percent of total assets.

At the time of their closure, the estimated present-value cost to the now defunct Federal Savings and Loan Insurance Corporation (FSLIC) to resolve the 205 thrift failures exceeded $32 billion. Because of their poor financial condition, some of these thrifts could not provide adequate collateral (that is, eligible assets) to secure their FHLBank loans.[1] Hence, the FSLIC issued guarantees for some of the more poorly capitalized thrifts to secure the funds lent by FHLBanks (see Garcia and Plautz, 1988).[2] Given these developments, the question of whether FHLBank lending to financially distressed thrifts increased FSLIC losses during the 1980s naturally arises. Because FHLBanks' claim on thrift assets was senior to that of the FSLIC, lending to troubled thrifts increased the risk of loss to the FSLIC and potentially added to the cost of thrift failure resolutions. As a result, taxpayers and policymakers have an interest in understanding the economic role of the FHLBank System in the thrift debacle of the 1980s and how a given government regulatory structure can have unintended consequences.

The FHLBank System was created to provide long-term liquidity to residential real-estate-specialized lending institutions so as to improve the flow of mortgage credit. While this concept made sense after the Great Depression, it may not make sense in a financial market that has become more efficient with the introduction of a secondary market for mortgages and mortgage securitization. These developments raise the question whether there is a need for a government-sponsored liquidity facility for real-estate-specialized lending institutions. The question takes on added importance in view of evidence that smaller thrifts, which are likely to have fewer alternative

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sources of long-term liquidity, tend to use the FHLBank advance (loan) program less than larger thrifts. Also, it is important to note that FHLBank advances do not subject borrowing thrifts to the discipline that would be imposed by other creditors and market analysts. By insulating them from market discipline, FHLBank advance programs provide incentives for borrowing thrifts to take more risk. This is an important issue for policymakers, who are concerned about minimizing the loss exposure of the federal deposit insurance funds.

During the thrift debacle of the 1980s, FHLBank advances to individual thrifts varied considerably in terms of net worth and borrowings relative to the thrifts' total assets. We use data on these variations to test whether FHLBanks made credit available to the most troubled thrifts, defined as those with the largest gap between their regulatory accounting principle (RAP) capital and generally accepted accounting principle (GAAP) capital. RAP allowed thrifts to count, as part of capital, appraised equity capital, qualifying subordinated debentures, and net worth certificates issued by the Federal Home Loan Bank Board (FHLBB) to increase *recorded*, though not *economic*, net worth. In addition, thrifts were allowed to defer losses on the sale of assets that carried below-market interest rates.[3] These items capture the extent to which regulators granted thrifts regulatory forbearance by allowing them to "invent" assets that artificially inflated their capital. These modifications in the definition of capital were designed to give troubled thrifts time to initiate strategies that would return them to financial health. Thrifts with most of their reported capital in these forms might not be able to raise noninsured sources of funds in the private sector. FHLBank lending to thrifts with the largest gap between RAP and GAAP capital gave them time to attempt to recover, as well as time to "gamble for resurrection" by making large volumes of higher-risk, potentially high-profit investments. If the investments made good, the thrift would reap the profits, but if the investments soured and the thrift went broke, the FSLIC and not the thrift's owners would be liable for the losses. This incentive to gamble for resurrection is strongest when there is little equity left. Thus, it is likely that the magnitude and cost to taxpayers of the 1980s thrift debacle were increased by regulatory forbearance policies, including FHLBanks' provision of aid to financially distressed firms.[4]

In addition to examining whether financially distressed thrifts made greater use of FHLBank advances than financially sound thrifts, we consider whether the pattern of borrowings differed by FHLBank district. Because of the collapse of the oil industry and its associated effect on real estate prices in the early 1980s, many thrift institutions in the ninth district of the FHLBank System (Arkansas, Louisiana, Mississippi, New Mexico, and Texas) became insolvent.[5] In some states, congressional pressure persuaded thrift regulators to grant forbearance and increased access to the FHLBank advance program to aid poorly capitalized institutions. Finally, because we would expect financially distressed thrifts to benefit most from access to FHLBank funds and this benefit to be reflected in their stock returns, we examine whether changes in FHLBank advances are related to thrift stock returns.

We find that total advances to thrift institutions rose sharply over the 1980s, reached a peak in 1988, and declined in the latter part of the 1980s and early 1990s. The peak borrowing was reached in 1988, one year prior to the enactment of FIRREA, and the decline took place over the period when regulators were closing down failing thrifts. We find that, for each year from 1985 to 1991, thrifts with book-value capital less than or equal to zero borrowed proportionately more from FHLBanks than better capitalized thrifts. That is, there is a negative correlation between FHLBank advances and capital. Our results are consistent with those of Garcia and Plautz (1988), who used data for FSLIC-insured thrifts for the fourth quarter of 1986 to show that the growth of FHLBank advances was greater for troubled thrifts than other institutions.

To get a better sense of whether troubled thrifts relied more heavily on FHLBank advances than their financially stronger counterparts, we use annual data for all FSLIC-insured thrifts from 1985 to 1991 to examine the relationship between FHLBank advances and several measures of thrifts' financial condition. Because poorly capitalized thrifts held a greater proportion of risky assets than other thrifts and thrifts with a high proportion of risky assets tended to borrow more from FHLBanks, our finding that FHLBank advances increased with thrift undercapitization could reflect the risky assets in thrift asset portfolios. To control for this effect, we estimate the relationship between FHLBank advances and various financial factors, including risky asset ratios, book capitalization, and the extent to which book capital has been inflated by regulatory accounting practices. We find that the relationship between book capital and FHLBank advances, controlling for risky assets, is negative. That is, financially distressed thrifts tended to borrow more on average than financially stronger thrifts. We also find that FHLBank advances increase when assets are riskier. This contradicts the notion that FHLBanks lend to safe and sound institutions.

The variable measuring the extent to which thrifts were using regulatory cosmetic accounting techniques to artificially inflate their capital position is positively correlated with FHLBank advances. Thus, a thrift using a relatively high amount of regulatory accounting items tended to borrow more from an FHLBank than another thrift, even if they had the same book capital ratio. This finding is important because it suggests that regulators' modifications of rules to close down insolvent depository institutions can increase the value of access to government subsidies (such as FHLBank advances) and affect the behavior of the regulated institutions.

Finally, we use quarterly stock market return data for 99 publicly traded thrift organizations from 1985 to 1992 to determine whether borrowing from FHLBanks was viewed favorably by the stock market. This expands on the work of Brewer (1995) and Brewer and Mondschean (1994), which examined the impact of asset mix changes on common stock returns of financially distressed thrifts and their healthier counterparts. Both studies found that thrifts, depending on their financial condition, can exploit underpriced federal deposit insurance by shifting into riskier activities, because such shifts raise asset risk, increasing the value of deposit insurance and leading to higher common stock returns. Similarly, increases in advances from FHLBanks, using thrift good assets as collateral, allow thrifts to exploit federal deposit insurance by increasing the risk to the FSLIC. We would expect the stock returns of troubled thrifts to increase more than those of financially sound thrifts when they increase their borrowing from FHLBanks. Our stock return results suggest that having increased access to FHLBanks advances was associated with one-time increases in the common stock returns of troubled thrifts. Because FHLBank claims on thrift assets are senior to those of the FSLIC, lending to troubled thrifts increased the risk of the FSLIC's position. This shift benefited shareholders because, during the period under review, the regulators did not charge a risk-based deposit insurance premium. Our results indicate that the benefits from borrowing at FHLBanks were associated with higher stock returns.

Structure of the FHLBank System

The financial distress that thrifts experienced and the accompanying disruption in the mortgage market during the Great Depression prompted Congress to pass several bills to stabilize the savings and home financing industry. First, Congress passed the Federal Home Loan Act of 1932, creating the FHLBank System. This system, designed along the lines of the Federal Reserve System, consists of 12 FHLBanks, each serving a geographically distinct district. In addition, the Home Owner's Loan Act of 1933 created the FHLBank Board as a federal government agency with supervisory responsibility for the FHLBanks.

The main purposes of the FHLBank System were to provide liquidity to thrifts, thereby facilitating home ownership through greater availability of mortgages, and to be the primary federal regulator of thrifts. Similar to district Federal Reserve banks, FHLBanks are wholly owned by member institutions. Prior to 1989, members included all federal savings and loan associations and state chartered savings and loans that voluntarily chose and qualified to be members.[6] Each member institution is required to hold an equity stake in its district FHLBank.

In 1934, Congress enacted the National Housing Act, which established the FSLIC within the FHLBB, to promote confidence in the thrift industry through share capital (or deposit) insurance at thrifts. The initial deposit insurance was $5,000 per account, similar to that at commercial banks. This amount has been increased periodically, with the last change to $100,000 occurring in 1980.

This supervisory and regulatory structure remained in place until the late 1980s, when the deterioration in the financial condition of the S&L industry caused Congress to restructure the way the industry is regulated and insured and improve supervisory control. FIRREA, signed into law by President Bush on August 9, 1989, abolished both the FSLIC and the FHLBB. In their place, the act established the Federal Housing Finance Board (FHFB) as an independent agency, responsible for overseeing the operations of the 12 regional FHLBanks, relinquished control of the insurance functions to the Federal Deposit Insurance Corporation (FDIC), and transferred the thrift supervisory and regulatory functions of the FHLBB and the FHLBanks to a new Office of Thrift Supervision (OTS) in the Department of the Treasury.

The FHFB consists of a five-member board, including the Secretary of Housing and Urban Development, and is funded through assessments on the FHLBanks.[7] The board ensures that the FHLBanks carry out their housing finance mission, remain adequately capitalized, and are able to raise funds in the capital market. In addition, the FHFB must ensure that the FHLBanks operate in a safe and sound manner by following regulations governing their operations.

Financial condition of FHLBanks

At the end of 1996, total assets of the FHLBanks exceeded $292 billion, up 61 percent from the end of

TABLE 1

Financial characteristics of FHLBanks
($ in millions)

Year	Advances	Investments	Consolidated obligations	Capital stock	FHLB assets	Retained earnings	Total capital	Total assets	Capital ratio
1960	$1,981	$1,233	$1,266	$989	$3,316	$83	$1,072	$3,316	0.3233
1965	5,997	1,640	5,221	1,277	7,806	158	1,435	7,806	0.1838
1970	10,615	3,732	10,181	1,607	14,723	260	1,867	14,723	0.1268
1971	7,936	2,520	6,840	1,618	11,001	281	1,899	11,001	0.1726
1972	7,979	2,225	6,671	1,756	10,731	299	2,055	10,731	0.1915
1973	15,147	3,437	14,449	2,122	19,066	374	2,496	19,066	0.1309
1974	21,804	3,097	19,445	2,624	25,499	539	3,163	25,499	0.1240
1975	17,845	4,376	16,383	2,705	22,708	590	3,295	22,708	0.1451
1976	15,862	6,079	14,620	2,889	22,481	634	3,523	22,481	0.1567
1977	20,173	3,749	16,009	3,295	24,566	681	3,976	24,566	0.1618
1978	32,670	3,414	25,109	4,120	36,767	837	4,957	36,767	0.1348
1979	41,838	3,693	30,372	5,149	46,428	943	6,092	46,428	0.1312
1980	48,963	4,328	37,268	5,160	54,347	869	6,029	54,347	0.1109
1981	65,194	8,157	54,131	5,827	74,680	974	6,801	74,680	0.0911
1982	66,011	12,575	55,972	6,269	80,262	1,144	7,413	80,262	0.0924
1983	58,977	9,841	48,931	6,395	72,490	1,339	7,734	72,490	0.1067
1984	74,618	17,584	65,085	7,200	96,993	1,503	8,703	96,993	0.0897
1985	88,835	19,243	74,460	8,313	112,179	1,792	10,105	112,179	0.0901
1986	108,645	17,388	88,752	9,485	131,427	2,323	11,808	131,427	0.0898
1987	133,058	16,538	116,386	11,281	154,177	2,464	13,745	154,177	0.0892
1988	152,799	16,981	136,513	13,177	174,737	2,343	15,520	174,737	0.0888
1989	141,795	33,912	136,799	13,385	180,677	820	14,205	180,677	0.0786
1990	117,103	44,280	118,437	11,104	165,742	521	11,625	165,742	0.0701
1991	79,065	71,740	108,149	10,200	154,556	495	10,695	154,556	0.0692
1992	79,884	79,133	114,652	9,921	162,134	531	10,452	162,134	0.0645

Source: Federal Housing Finance Board.

1989 (see table 1). The FHLBanks are capitalized through the retention of earnings and the purchase of stock by member institutions. As of yearend 1996, the FHLBanks, on a consolidated basis, had a book capital (including par value of common stock and retained earnings) to total on-balance-sheet asset ratio of 5.5 percent.[8] This ratio is slightly higher than the target leverage ratio of 5 percent for depository institutions to be classified as well capitalized under prompt corrective action provisions of the FDIC Improvement Act of 1991. However, because all members of the FHLBank System, except federally chartered thrifts, can withdraw from membership, the permanence of this capital base is questionable at best. While a member's capital stock cannot be withdrawn immediately upon demand and an FHLBank cannot redeem stock if the redemption would cause the FHLBank to be undercapitalized, the temporary nature of the capital base could be of concern if the FHLBanks experience losses or membership becomes unattractive.

In addition to capital, funding for FHLBanks comes from debt issued as consolidated obligations of the 12 FHLBanks and consists of bonds and discount notes that are limited by statute to an amount not to exceed 20 times the total paid-in-capital stock and legal reserves of all FHLBanks. Although FHLBank System debt does not carry an explicit federal government guarantee, the fact that FHLBanks operate under a federal charter and government supervision creates a perception of an implicit government guarantee. FHLBank debt carries an AAA credit rating and coupon income is exempt from state and local income taxes.

FHLBank funds are used to make advances to member thrift institutions and to hold a portfolio of investment securities. Traditionally, FHLBanks held a portfolio of investment securities to earn interest income on proceeds from prepaid loans from member institutions, to invest members' overnight deposits, and to have a ready source of liquidity to satisfy unanticipated demands for advances by member institutions (see table 2). The types of investment securities that FHLBanks can hold are determined by their supervisory agency and include obligations of the U.S. Treasury, Federal National Mortgage Association, and Government National Mortgage Association; mortgages, obligations, or other securities sold by the Federal Home Loan Mortgage Corporation; and instruments a fiduciary or trust fund may invest in under the laws of the state in which the FHLBank is located. Holdings of investment securities grew about 130 percent between the end of 1985 and the end of 1990.

During the 1980s, advances averaged about 84 percent of the FHLBank System's total assets, ranging from 78 percent to 90 percent over the decade. FHLBanks are required to secure the funds advanced to member institutions. The collateralization feature gives FHLBanks prior claim to assets in the event of a thrift failure. The collateral is in the form of first mortgages, U.S. government securities (Treasury and agency securities), deposits at FHLBanks, and real estate assets approved by FHLBanks. While U.S. government securities and deposits at FHLBanks represent high-quality collateral, mortgages could be low-quality collateral if underwriting standards are poor, leading to substandard loans. Although borrowing institutions have different risk profiles and the quality of their collateral may vary, FHLBanks offer advances at a flat rate independent of risk. Furthermore, FHLBanks offer advances at lower interest rates than the thrifts could obtain on their own. This is possible because FHLBanks, in turn, are able to jointly issue consolidated

TABLE 2

Investment portfolios of FHLBanks
(percent of total investments)

Type of security	1985	1987	1989	1991	1992
Treasury securities	5.57	4.76	2.79	1.62	4.05
Federal agency securities	0.33	0.53	0.55	0.00	15.16
Federal funds	75.76	71.27	62.93	44.53	34.49
Bankers' acceptances	0.37	0.22	0.34	0.00	0.00
Certificates of deposit	0.97	1.71	0.97	0.00	0.00
FHLBank consolidated securities fund[a]	16.96	20.19	20.60	0.00	0.00
Securities repurchase agreements	0.00	0.00	0.00	15.17	12.33
Commercial paper[b]	0.00	0.00	5.88	9.75	0.00
Mortgage-backed securities	0.00	0.00	6.23	21.33	29.06
Other securities	0.03	1.74	0.00	7.69	4.91
Total dollar investments *(billions)*	19.3	17.4	32.0	72.4	79.7
Percent of total assets	17.0	11.0	18.0	46.0	49.0

[a]The consolidated securities fund is a centralized portfolio management system for securities owned by FHLBanks operated by the Office of Finance. It invests primarily in short-term money market instruments.

[b]Beginning in 1996, commercial paper also contains bank notes.

Source: Federal Housing Finance Board.

obligations, or debt securities to the market, paying rates lower than similar securities issued by depository institutions. The market is willing to accept lower investment rates due to the tax-exempt status of the consolidated obligations and because it is pricing in an implicit government backing of the securities.

FHLBank advances support the home mortgage market

Proponents of the FHLBank System felt that thrifts needed the liquidity provided by the FHLBank advance program because of the maturity mismatch between their liabilities and assets. A typical thrift makes long-term, fixed rate mortgage loans, financed by short-term, effectively variable rate deposits, which can make for challenging financial management. A sudden increase in market rates, for example, can create several difficulties for a thrift. Because incoming mortgage interest income is based on fixed-rate mortgage loans, it cannot re-price such mortgages at the higher market rates of interest. Due to the long-term nature of such assets, the thrift could miss out for several years on the higher market interest rates that an institution with a shorter term asset structure would enjoy. Furthermore, if the increase in market interest rates is sharp and unexpected and the thrift is not able to increase its deposit rates quickly, it could experience substantial deposit outflows as its customers transfer their funds into instruments with more attractive returns. Such a deposit outflow would make it difficult for the thrift to fund new, higher-yielding mortgage loans. Even if the thrift reacts to the increased market interest rate by offering competitive rates to its depositors, it then has to pay out more than it is receiving in income from older mortgage loans. The advances provided by FHLBanks can ease some of these difficulties by supporting the lending activities of the thrift industry.

The statement of policy on advances in the Code of Federal Regulation indicates that:

"[T]he primary credit mission of the Federal Home Loan Banks is to provide a reliable source of credit for member institutions. ... Advances generally shall be made to creditworthy members upon application for any sound business purpose in which members are authorized to engage. Such purposes include, but are not limited to, making residential mortgage, consumer, and commercial loans, covering savings withdrawals, accommodating seasonal cash needs, restructuring liabilities, and maintaining adequate liquidity." (U.S. Federal Home Loan Bank System, 1987, 531.1)

By providing member institutions with access to advances with maturities varying from overnight to 20 years (see table 3), FHLBanks can stabilize the flow of residential mortgage loans issued by thrifts during periods of deposit outflows. The availability of FHLBank advances enhances the liquidity of mortgages and mortgage-related assets, such as mortgage-backed securities. Since thrifts and other depository institutions face fluctuations in their deposits, they need to hold a sufficient amount of liquid assets. Mortgage loans and other long-term assets are illiquid, but they can be used as collateral to borrow from FHLBanks. The availability of FHLBank loans allows member institutions to hold a more illiquid and, presumably, a more profitable asset portfolio than otherwise. Furthermore, FHLBank advances provide a means to move surplus funds from regions of the country with excess funds to regions where demand for mortgage financing exceeds the local institutions' supply of funds.

Figure 1 shows the trend in advances over the 1970–92 period and table 4 reports on FHLBank lending activity in selected years from 1960 to 1992. As noted earlier, advances to FHLBank members rose sharply during the early 1980s, reached a peak in 1988,

TABLE 3

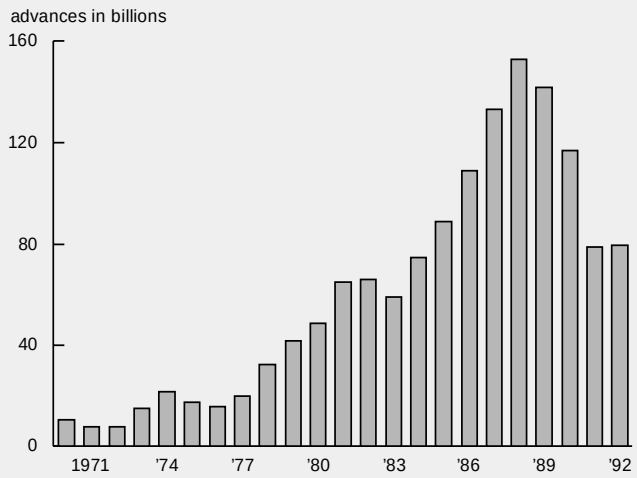
Maturity distribution of FHLBank advances
($ in millions)

Years	1985	Percent of total	1987	Percent of total	1989	Percent of total	1992	Percent of total
1	40,687	46	50,803	38	33,783	28	33,184	41
2	13,777	16	20,235	15	30,202	25	14,127	18
3	11,189	13	15,057	11	18,196	15	11,824	15
4	5,630	6	14,187	11	15,872	13	6,075	8
5	5,797	6	10,597	8	7,657	6	6,750	8
Longer than 5	11,771	13	22,175	17	14,731	12	7,946	10
Total	**88,851**		**133,055**		**120,443**		**79,906**	

Source: Federal Home Loan Bank System, *Financial Reports*, 1985, 1987, 1989, and 1992.

FIGURE 1

Total FHLB advances outstanding



Sources: United States League of Savings Institutions, *Savings Institutions Sourcebook*, 1987; FHLBank System, *Financial Reports*, Washington, DC, 1987–92; and Office of Thrift Supervision, *Savings and Home Financing Source Book*, Washington, DC, 1989.

TABLE 4

FHLBank lending activity
($ in millions)

Year	Advances			Percent, FHLBank members' assets
	Made	Repaid	Outstanding	
1960	1,943	2,097	1,981	2.9
1965	5,007	4,335	5,997	4.7
1970	3,255	1,930	10,615	6.2
1971	2,714	5,392	7,936	3.9
1972	4,792	4,750	7,979	3.4
1973	10,013	2,845	15,147	5.7
1974	12,763	6,106	21,804	7.5
1975	5,468	9,425	17,845	5.4
1976	8,114	10,097	15,862	4.1
1977	13,756	9,445	20,173	4.5
1978	25,166	12,800	32,670	6.3
1979	29,166	19,998	41,838	7.3
1980	36,585	29,460	48,963	7.9
1981	53,941	37,709	65,194	10.0
1982	53,744	52,928	66,011	9.5
1983	44,724	51,758	58,977	7.8
1984	91,239	75,598	74,618	8.4
1985	133,651	119,417	88,835	9.4
1986	181,661	161,833	108,645	9.3
1987	194,381	170,000	133,058	10.6
1988	187,536	167,809	152,799	11.5
1989	218,876	229,874	141,795	11.3
1990	149,459	174,157	117,103	—
1991	175,673	213,710	79,065	—
1992	263,088	262,186	79,884	—

Sources: United States League of Savings Institutions, *Savings Institutions Sourcebook*, 1987; FHLBank System, *Financial Reports*, Washington, DC, 1987–92; and Office of Thrift Supervision, *Savings and Home Financing Source Book*, Washington, DC, 1989.

and declined during the late 1980s and early 1990s. FHLBank advances offer member institutions several advantages over other sources of funds. First, advances are immediately available. Second, member institutions have a fair amount of flexibility in choosing the maturity and volume of their advances. Third, advances do not carry the withdrawal risk associated with deposits. Fourth, unlike deposits, no reserve requirements or deposit insurance premiums are associated with advances.[9] The results of a recent study of the FHLBank loan program indicated that in addition to the traditional use of advances as a source of liquidity, advances are a particularly attractive source of funds for poorly capitalized thrifts. Using data for the fourth quarter of 1986, Garcia and Plautz (1988) show that deposit outflows are offset by increased advances. This study also found that advances to low-capital firms nationwide and in states with the largest number of troubled thrifts (for example, California, Louisiana, Oklahoma, Oregon, and Texas) rose more quickly than the national average.

FHLBank advances aid poorly capitalized thrifts

Proponents of the FHLBank System argue that FHLBank advances are necessary to provide lending institutions that specialize in real estate access to nondeposit sources of funds because such institutions have few, if any, alternative nondeposit sources of funds. This is especially a concern for small thrifts, which may not participate in the repurchase agreement, commercial paper, or brokered deposits markets. However, in 1988, advances to institutions with less than $500 million in total assets accounted for only 13 percent of all advances (see table 5). On the other hand, thrifts with total assets in excess of $500 million relied heavily on advances in 1988, with some 89 percent borrowing from FHLBanks, accounting for 87 percent of total FHLBank advances. Furthermore, FHLBank advances, which represented 11 percent, on average, of the borrowers' total assets in 1988, were being used to replace more costly funding sources rather

TABLE 5

FHLBank thrift borrower characteristics
(December 31, 1988)

Asset size	Number of institutions	Percent that borrow	Advances to borrower assets, percent	Percent of all outstanding advances
Thrifts	2,991	62	11	
Less than $500 million	2,542	57	8	13
$500 million or more	449	89	12	87

Source: Federal Reserve Board of Governors, *Savings and Loan Regulatory Reports*, December 31, 1988.

than to fund additional mortgage lending (see Garcia and Plautz, 1988, and Mays and DeMarco, 1989).

During the thrift debacle of the 1980s, FHLBank advances were increasingly used to provide assistance to failing thrifts that were losing deposits, particularly uninsured deposits. FHLBanks made advances to thrifts that would have found it more difficult and more costly to raise funds through other sources. At times, they even made advances to thrifts that lacked the necessary collateral in exchange for a guarantee of repayment provided by the FSLIC (see Garcia and Plautz, 1988). Finally, when a thrift had exhausted all collateral options and FSLIC guarantees were not available, advances were made by the Joint Lending Program of the Federal Reserve Banks, the FHLBanks, and the FSLIC.[10]

Table 6 shows the proportion of yearend total assets financed with advances for thrifts nationwide and for thrifts in the six states (California, Florida, Illinois, Louisiana, Oklahoma, and Texas) that accounted for the largest share of the total cost of failure resolutions from 1985 to 1991.[11] Both nationwide and in five of the six states, insolvent thrifts, that is, thrifts with GAAP capital less than or equal to zero, borrowed proportionately more from FHLBanks than solvent institutions. From these limited data, insolvent thrifts appeared to use more FHLBank advances than the rest of the industry.

The tendency of FHLBanks to aid troubled thrifts raises several issues. First, FHLBanks are providing subsidized aid. Rates on advances, which are fixed at the time of borrowing, vary by maturity and date of commitment but not by risk of the borrowing thrift. The rates on advances are set by each FHLBank as a fixed spread over the System's expected cost of funds.[12] According to Garcia and Plautz (1988), these rates should be comparable to the rates that a large, well-capitalized thrift could obtain on its own account. While a large, well-capitalized thrift may be paying a "fair" price for advances, a financially distressed association would be obtaining funds at below market rates.

Second, during the 1980s, aid to financially distressed thrifts by FHLBanks provided the funds necessary for the government to engage in capital forbearance. This practice allowed weak (high-risk) thrifts to continue to operate without the capital constraints imposed on strong (low-risk) thrifts. Supporters of forbearance policies argued that thrifts weakened by technical liquidity problems—cash outflows exceeding inflows—should be given the chance to recover.[13] As these temporary problems went away, the thrifts could use their new profits to build equity and reserves against future losses. However, in the late 1980s, forbearance was bestowed on thrifts experiencing credit quality problems that far exceeded issues of technical liquidity.

The practice of forbearance exempted some thrifts from regulatory capital requirements for extended periods of time. Other thrifts benefiting from forbearance were allowed to invent value for assets that artificially inflated their regulatory net worth. These included nonstandard considerations of appraised equity capital, income capital certificates, net worth certificates, and deferred losses. FHLBanks supported forbearance by extending advances to many failing thrifts as they lost deposits, particularly uninsured deposits.

Lack of reserves in the FSLIC fund prevented thrift regulators from resolving institutions commonly known to be beyond hope of recovery. The Competitive Equality Banking Act of 1987, among other things, required the FHLBB to give thrifts time to initiate strategies for a return to capital adequacy.

However, the evidence shows that capital forbearance was a gamble for the FSLIC and its cost turned out to be significant (see DeGennaro and Thomson, 1996). The policy encouraged thrift management to gamble for resurrection by making large volumes of high-risk, potentially high-profit loans. If the gamble paid off, the thrift would reap the profits; if it backfired,

TABLE 6

Federal Home Loan Bank thrift advances, December 31 of each year
(Percent of total assets)

	Capital ratio	1985	1986	1987	1988	1989	1990	1991
Total industry	≤ to 0%	6.75	8.05	9.37	10.82	9.52	7.40	4.04
	0–3%	4.82	5.16	6.91	7.78	7.86	6.79	5.51
	>3%	2.77	3.24	4.13	4.29	3.67	3.14	2.83
	Total industry	3.78	4.25	5.34	5.54	4.93	3.79	3.04
California	≤ to 0%	9.81	8.09	3.29	3.48	3.14	8.21	2.17
	0–3%	5.30	5.90	5.08	6.81	6.26	5.20	1.13
	>3%	3.54	3.79	4.54	5.08	5.25	5.77	5.37
	Total state	4.70	4.70	4.40	5.15	5.11	5.82	4.91
Florida	≤ to 0%	6.38	7.48	9.56	10.85	8.00	9.28	2.47
	0–3%	5.40	5.63	8.58	9.95	7.49	3.90	2.76
	>3%	3.37	4.34	5.45	6.14	4.99	3.95	4.49
	Total state	4.21	4.92	6.43	7.20	5.80	4.67	4.00
Illinois	≤ to 0%	3.51	4.19	6.09	6.29	4.78	6.01	6.18
	0–3%	3.67	3.38	4.15	4.33	3.62	3.19	1.08
	>3%	1.24	2.07	2.45	2.06	1.92	1.68	1.28
	Total state	2.33	2.76	3.50	3.12	2.57	1.92	1.38
Louisianna	≤ to 0%	12.32	10.85	13.10	15.77	12.13	6.73	1.87
	0–3%	4.60	4.33	5.05	5.40	2.24	0.90	1.56
	>3%	2.33	2.62	3.65	5.32	3.54	1.32	0.56
	Total state	5.49	5.25	6.43	8.81	6.53	2.81	0.75
Oklahoma	≤ to 0%	5.99	8.74	11.57	7.87	9.07	9.72	0
	0–3%	8.31	7.60	10.69	10.67	11.35	7.95	0.71
	>3%	5.50	5.20	5.45	9.11	5.24	6.92	4.97
	Total state	6.07	6.77	8.84	9.48	8.03	7.58	3.85
Texas	≤ to 0%	6.26	9.97	11.30	13.86	10.24	5.86	0
	0–3%	3.88	4.38	6.40	10.64	14.77	6.69	0.40
	>3%	4.31	4.26	5.80	7.03	5.02	5.49	4.80
	Total state	4.52	6.01	8.36	10.45	9.19	5.75	4.08

Notes: These figures are averages of the ratio of FHLBank advances to total assets. Thrifts are divided into three groups: 1) Thrifts with negative book equity according to generally accepted accounting principles; 2) low-capital thrifts, with positive net worth below 3 percent of assets; and 3) well-capitalized thrifts, with net worth above 3 percent of assets.

Source: Federal Reserve Board of Governors, *Savings and Loan Regulatory Reports*, 1985–91.

the FSLIC would be liable for the losses. This incentive arises from the combination of deregulation, inadequate regulatory supervision, and deposit insurance premiums that are not based on risk, and it is strongest when there is little equity left. Thus, the magnitude and cost of the thrift debacle in the 1980s were likely increased by forbearance practices that included, among other things, FHLBanks providing aid to financially distressed firms.

Table 7 provides financial characteristics of the 205 thrifts that were resolved by the FSLIC in 1988, the year before Congress passed FIRREA. Barth, Bartholomew, and Labich (1989) report that a substantial number of these resolved thrifts had been insolvent since the early 1980s. The delay in closing insolvent thrifts increased the value of access to deposit insurance and allowed thrifts to shift more risk to the deposit insurer. As table 7 shows, the thrifts resolved in 1988 held more commercial real estate loans, acquisition and development loans, non-mortgage loans (business and consumer), and direct investments—all generally viewed as riskier asset classes than residential mortgage loans—than the industry average in each of the three years prior to failure. At the same time, FHLBank advances as a fraction of total assets were higher at resolved thrifts than at non-resolved thrifts, rising from 6.4 percent at the end of 1985 to 10.6 percent in the last year before closure in 1988. These numbers suggest that FHLBank advances grew as thrift capital declined; advances also grew with the extent to

TABLE 7

FHLBank advances and other financial characteristics of 1988 resolutions (Percent of total assets)

	1985		1986		1987	
Financial ratios	**1988 failures**	**Industry**	**1988 failures**	**Industry**	**1988 failures**	**Industry**
Mortgage loans						
Residential	34.84	50.84	33.06	48.27	32.78	48.86
Commercial	13.76	8.52	12.65	8.48	11.96	8.31
Land	9.50	2.53	8.55	2.40	6.00	1.98
Others	12.54	11.44	12.17	12.03	11.76	13.58
Nonmortgage loans	7.18	5.48	7.45	5.65	6.91	5.66
Direct investment	4.72	1.29	5.06	1.36	5.35	1.37
Junk bonds	0.15	0.10	0.16	0.10	0.15	0.10
Advances	6.39	3.78	8.33	4.25	10.65	5.34
RAP	1.61	5.26	–5.57	4.82	–19.41	3.60
GAAP	–0.84	4.13	–8.10	3.77	–22.14	2.65
TAP	–2.56	3.30	–9.74	2.98	–23.55	1.83
Return on assets	–0.48	0.04	–2.08	–0.13	–2.84	–0.30

Notes: Data are for 205 thrifts resolved in 1988. RAP is regulatory accounting principle capital; GAAP is generally accepted accounting principle capital; and TAP is tangible accounting principle capital.
Source: Federal Reserve Board of Governors, *Savings and Loan Regulatory Reports*, yearend 1985, 1986, and 1987.

which regulatory accounting practices artificially inflated capital. The result of these practices was the delayed closure of insolvent thrifts.[14] We examine this issue further using a regression equation that relates FHLBank advances to several factors, including the impact of regulatory accounting practices on thrift capital.

Developing a model to explain FHLBank advances

Our empirical analysis uses a regression model which relates a thrift's ratio of FHLBank advances to total assets to the riskiness of its asset portfolio, book capital relative to total assets, return on assets, regulatory forbearance, and the district in which the thrift is located. A formal discussion of our regression model is presented in technical appendix 1.

The riskiness of a thrift's asset portfolio is measured using the institution's holdings of commercial real estate, residential mortgage loans, and acquisition and development loans. Insolvent or high-risk thrifts tend to hold more commercial real estate loans and may finance such loans with advances from FHLBanks. Acquisition and development loans, which are loans to finance the purchase of land and the improvements required to convert it to developed building lots, have been found to add to resolution costs. However, Benston (1985) finds that changes in a thrift's capital are positively correlated with changes in acquisition and development loans. Based on the findings of Barth, Bartholomew, and Labich (1989) and Brewer and Mondschean (1994), we predict that such loans would be positively correlated with advances.

The capital ratio, defined as the ratio of GAAP net worth to total assets, should be negatively correlated with advances. A decline in capital relative to total assets increases the cost of alternative sources of funds, making advances more attractive because the advance rate does not vary with a thrift's financial condition. Thus, thrifts with low capital ratios will tend to borrow more from their FHLBanks than those with higher capital ratios. Earnings are relevant because current profitability, defined as the ratio of net income to total assets, may be a good indicator of a thrift's future performance. Current profitability also measures an institution's ability to maintain capital. A decline in current profitability can be indicative of a relatively weak financial condition, and is likely to increase the cost of nondeposit sources of funds.

The extent to which regulators have permitted cosmetic increases of capital through the use of various balance sheet "tricks" may be correlated with the ratio of FHLBank advances to total assets. Table 8 provides a list of items thrift regulators included in capital during the 1980s. To the extent that regulatory accounting practices delay the closure of troubled thrifts, we would expect these thrifts to exploit the advantages of access to flat-rate FHLBank advances. We measure regulatory forbearance as the difference between RAP-defined capital and GAAP-defined

TABLE 8

Items used to artificially raise recorded capital

1. Losses from the sale of assets with below market yields can be deferred (1981). Generally accepted accounting principles (GAAP) do not permit this type of account to be included in capital.
2. The Federal Home Loan Bank Board (FHLBB) allowed qualifying mutual capital certificates to be used by savings and loans to increase reported net worth (1980).
3. Income capital certificates are sold (for cash or interest-bearing notes) to the Federal Savings and Loans Insurance Corporation to increase reported net worth (1981). This item was included in GAAP net worth in 1984.
4. Net worth certificates are authorized by the Garn-St Germain Depository Institutions Act of 1982 to increase reported net worth (October 1982).
5. Contra-asset accounts, including loans in process, unearned discounts, and deferred fees and credits, are included in net worth (June 1982).
6. Appraised equity capital (excess over book value of appraised value of office land, buildings, and improvements, as permitted by the FHLBB) is included in net worth (1982).
7. Qualifying subordinated debentures having remaining term to maturity or term to redemption exceeding one year are included in net worth (1982).
8. Equity can be increased by the amount of goodwill and other intangible assets resulting from a merger. Goodwill is the difference between the market value of a firm's net worth and the value based on tangible assets only. Goodwill represents the value of a franchise, including name recognition, an established reputation, and loyal customers. For many thrifts, goodwill was booked as capital when they acquired other enterprises at greater than tangible asset value.

Source: Barth (1991).

capital.[15] We expect forbearance to be positively correlated with the ratio of FHLBank advances to total assets.

One of the major distinctions between RAP capital and GAAP capital is the treatment of gains and losses on the sale of mortgage loans, mortgage-related securities, and debt securities. GAAP requires immediate recognition of gains and losses, while RAP allows a thrift to defer and amortize such gains and losses. Brewer (1989) reports that GAAP-insolvent institutions tend to hold more deferred losses per dollar of assets than solvent institutions. In the empirical specification, we examine the relationship between FHLBank advances and the tendency to defer loan losses.

Another accounting issue is the treatment of goodwill. Goodwill consists principally of the amount over book value paid by a thrift to acquire other thrifts. To encourage healthy thrifts to purchase financially distressed thrifts, regulators allowed the acquiring thrift to record the excess of the acquisition price over the market value of the capital of the troubled thrift as goodwill and to amortize it as an expense for up to 40 years.[16] This would inflate the thrift's recorded capital, helping to maintain its aura of safety. To the extent that thrift regulators used the advance program "to pay acquirers off" for taking over failing thrifts, we would expect FHLBank advances relative to total assets to increase with the ratio of goodwill to total assets.

As pointed out by Kane (1989) and Romer and Weingast (1992), interference in the regulatory process by members of Congress on behalf of thrifts in their districts delayed closure and, thus, gave thrifts time to engage in more risk-taking activities. According to Romer and Weingast (1992), this political interference was especially pronounced in the Dallas FHLBank district, as Texas bankers and real estate developers complained to their lawmakers that regulators were "unfairly" restricting real estate loans and refusing to allow lenders to restructure bad loans. This resulted in the well-known meeting between Edwin Gray, then chairman of the FHLBB, and Jim Wright, Speaker of the House of Representatives, to work out an agreement to give thrifts time to recover from their financial distress.[17] Because of this political interference, lending by FHLBanks to thrift institutions is likely to vary across the 12 FHLBank districts. To capture differences in lending across districts, we included in the regression equation an indicator variable for each FHLBank district.[18] The indicator variables absorb the effects of all factors that are common to thrifts in the same FHLBank district.

Our regression equation also includes several variables that are a composite of the asset risk variables and the Dallas FHLBank district indicator variable. These composite variables capture the impact of various political maneuvers in the Dallas FHLBank district on advances to thrift institutions. This allows us to determine whether thrifts in the Dallas FHLBank district with higher-risk asset portfolios tended to finance a greater proportion of their assets with FHLBank advances than those with lower-risk asset portfolios.[19]

Empirical results

The equation in technical appendix 1 examines the relationship between FHLBank advances relative to total assets and a set of correlates. Column 1 in table 9 represents the basic model, excluding the

TABLE 9

Relationship between advances and financial characteristics of FSLIC-insured thrifts (1985–91)

Variable	Basic controls	Deferred losses and goodwill	Composite variables (controlling for Dallas FHLBank district)	Deferred losses, goodwill, and composite variables
Intercept	–0.1106 (–21.53)***	–0.0776 (–20.49)***	–0.0789 (–9.49)***	–0.0776 (–9.24)***
Boston	0.0150 (4.84)***	0.0159 (5.12)***	–0.0234 (–2.70)***	–0.0202 (–2.30)**
New York	–0.0272 (–11.06)***	–0.0259 (–10.50)***	–0.0643 (–7.70)***	–0.0608 (–7.18)***
Pittsburgh	–0.0293 (–11.77)***	–0.0198 (–7.94)***	–0.0586 (–6.95)***	–0.0553 (–6.47)***
Atlanta	–0.0169 (–7.93)***	–0.0162 –7.54)***	–0.0563 (–6.72)***	–0.0532 (–6.26)***
Cincinnati	–0.0278 (–7.90)***	–0.0270 (–12.88)***	–0.0659 (–12.42)***	–0.0627 (–7.43)***
Indianapolis	–0.0199 (–8.23)***	–0.0188 (–7.76)***	–0.0575 (–6.26)***	–0.0541 (–6.38)***
Chicago	–0.0290 (–13.50)***	–0.0280 (–13.03)***	–0.0659 (–8.05)***	–0.0627 (–7.56)***
Des Moines	–0.0116 (–4.56)***	–0.0104 (–4.11)***	–0.0490 (–5.89)***	–0.0456 (–5.42)***
Topeka	0.0180 (6.04)***	0.0192 (6.45)***	–0.0208 (–2.46)**	–0.0173 (–2.03)**
San Francisco	–0.0284 (–10.95)***	–0.0277 (–10.60)***	–0.0678 (–7.98)***	–0.0648 (–7.52)***
Seattle	0.0259 (6.78)***	0.0268 (7.05)***	–0.0127 (–1.42)	–0.0095 (–1.06)
Time-1990	–0.0133 (–7.76)***	–0.0123 (–7.12)***	–0.0129 (–7.61)***	–0.01129 (–7.00)***
Commercial real estate (loans/total assets)	0.0926 (11.56)***	0.0945 (11.81)***	0.1113 (13.61)***	0.1120 (13.72)***
Commercial real estate × Dallas	—	—	–0.1141 (–4.06)***	–0.1090 (–1.22)***
Residential mortgage (loans/total assets)	0.0002 (0.06)	0.0025 (0.82)	0.0088 (3.15)***	0.0103 (3.69)***
Residential mortgage × Dallas	—	—	–0.0568 (–4.54)***	–0.0524 (–4.15)***
Acquisition and development (loans/total assets)	0.0193 (1.14)	0.0177 (1.04)	0.0841 (4.50)***	0.0837 (4.50)***
Acquisition and development × Dallas	—	—	–0.1241 (–3.84)***	–0.1242 (–3.83)***
Return on assets	–0.1467 (–1.53)	–0.1355 (–1.41)	–0.1486 (–1.57)	–0.1381 (–1.45)
Size	0.0143 (37.89)***	0.0137 (34.89)***	0.0143 (37.51)***	0.0137 (35.37)***
Capital ratio	–0.0382 (–1.78)*	–0.0392 (–1.81)*	–0.0405 (–2.04)**	–0.0414 (–2.05)**
Forbearance	0.2430 (4.50)***	0.4189 (3.52)***	0.2334 (4.50)***	0.4048 (3.50)***
Deferred loan loss to total assets	—	–0.2559 (–2.03)**	—	–0.2500 (–2.03)**
Goodwill to total assets	—	0.1776 (6.09)***	—	0.1686 (5.46)***
Number of observations	20,373	20,373	20,373	20,373
Adjusted R^2	0.22	0.23	0.23	0.23
F-statistic	244.38	231.02	223.22	212.30

* Indicates significance at the 10% level; ** indicates significance at the 5% level; and *** indicates significance at the 1% level.

Notes: This table provides the regression results of the relationship between the ratio of FHLBank advances to total assets and selected financial characteristics of FSLIC-insured thrifts. The basic controls are FHLBank indicator variables, commercial, residential, and acquisition and development loan ratios, return on assets, size of a thrift, the capital ratio, and the forbearance variable. The city variables are indicator variables for FHLBank districts. The indicator variable takes on a value of 1 if the thrift is located in that FHLBank district and 0 otherwise. The omitted indicator variable is the Dallas FHLBank district. Thus, the coefficients on the FHLBank district indicator variables are all relative to the Dallas FHLBank district. The mortgage loan variables are multiplied by the Dallas FHLBank district indicator variable (Dallas) to create some composite variables to be used in several of the empirical specifications. Dallas is equal to 1 if a thrift is located in the Dallas FHLBank district, zero otherwise. Time-1990 is equal to 1 if year is greater than or equal to 1990, zero otherwise. ROA is net income divided by total assets; size is the natural logarithm of total assets; capital ratio is generally accepted accounting principle capital divided by total assets; and forbearance is the difference between regulatory accounting principle capital and generally accepted accounting principle capital divided by total assets. The numbers in parentheses below the coefficient estimates are t-statistics.

Source: Authors' calculations.

separate effects on advances of deferred loan losses, goodwill, and the composite variables. Column 2 adds the separate effects of deferred loan losses and goodwill to the basic regression equation in column 1. Column 3 expands the basic equation to include the composite variables that interact the FHLBank of Dallas indicator variable with the asset risk measures. Column 4 adds the separate measures of regulatory forbearance (deferred loan losses and goodwill) to the empirical specification in column 3.

The results in table 9 column 1 indicate that the capital ratio and the forbearance variable are both correlated with thrift advances. Advances decline as capital increases, supporting the hypothesis that advances were particularly attractive to poorly capitalized institutions. The coefficient on the capital ratio, –0.0382, means that a 1 percentage point decrease in the capital ratio was associated with an approximately 0.4 percentage point increase in the ratio of FHLBank advances to total assets. Thrifts that relied heavily on regulatory accounting tricks to inflate their capital tended to borrow more from FHLBanks than other institutions. The coefficient suggests that a 1 percentage point increase in the difference between RAP capital and GAAP capital resulted in a 2.43 percentage point increase in the ratio of FHLBank advances to total assets. This is statistically significant at conventional levels.

The positive coefficients on commercial real estate loans and acquisition and development loans indicate that as the fraction of assets in these categories increased, institutions borrowed more. The results in table 9 also suggest that more profitable and smaller institutions tended to borrow less. The size effect is statistically significant at conventional levels, while the profitability effect is not. Finally, thrifts in the Dallas district tended to borrow more than thrifts in other FHLBank districts, except for thrifts in the FHLBank districts of Boston, Topeka, and Seattle. For example, thrifts in the Chicago district had, on average, an FHLBank advances-to-total-assets ratio that was 2.90 percentage points lower than that of thrifts in the Dallas district.

Table 9, column 2 includes measures of regulatory accounting tricks used to inflate recorded capital at thrifts. Holding everything else constant, thrifts that relied more heavily on deferred loan losses to inflate capital tended to borrow less, while those with relatively more goodwill tended to borrow more. The coefficient on the deferred loan loss variable suggests that a 1 percentage point increase in this variable was associated with a 2.56 percentage point decrease in the FHLBank advances-to-total-assets ratio. Thus, a thrift with a lower ratio of deferred loan losses to total assets than another thrift borrowed less from FHLBanks, even if the two institutions had the same gap between RAP capital and GAAP capital. Although the sale of assets with below market yields generates losses for a thrift, it is an alternative to FHLBank borrowing. The results in table 9 also imply that a 1 percentage point increase in the goodwill ratio was associated with a 1.78 percentage point increase in the FHLBank advances-to-total-assets ratio.

Column 3 of table 9 reports the results of including the composite variables (that is, the product of the Dallas FHLBank indicator variable and the risk variables) in the basic regression equation. The total impact on the advances ratio of thrifts in the Dallas district of, say, changes in residential mortgage loans is the sum of the coefficients on the residential mortgage loan ratio, 0.0088, and the residential mortgage loan ratio composite term, –0.0568. Similar calculations are performed to determine the impact on the advances ratio of thrifts in the Dallas district of changes in the other mortgage loan categories. For thrifts outside the Dallas district, the coefficients on the mortgage loan ratios capture the impact on those thrifts' advances ratio.

When the composite terms are added to the basic specification, the coefficient estimates on the capital, forbearance, earnings, and size variables are qualitatively similar to those reported in column 1 of table 9. For example, the capital ratio continues to be negatively correlated with the advances ratio, though the coefficient estimate is –0.0405 in this empirical specification compared with –0.0382 in the basic model in column 1. The results in column 3 suggest that thrifts in the Dallas FHLBank district with relatively higher assets devoted to, for example, residential mortgage loans tended to borrow less than other institutions (0.0088 – 0.0568 = –0.048). This implies that a 1 percentage point increase in the residential mortgage loan ratio was associated with a 0.05 percentage point decrease in the advances ratio. This result is inconsistent with the stated purpose of FHLBank advances to support the residential real estate market. Table 9, column 4 combines additional measures of regulatory capital forbearance with the specification used in column 3. The results are similar to those reported in column 3. Overall, low capital institutions borrowed more, and thrifts engaging in regulatory accounting practices made heavy use of the FHLBank lending facility.

The effects of FHLBank advances on common stock returns

Next, we examine whether changes in FHLBank advances were correlated with common stock returns and, if so, whether the correlation was positive for

TABLE 10

Thrift stock returns and changes in FHLBank advances by failure category
(Q1 1985 through Q4 1992)

Variable	Coefficient estimates
Intercept	–4.2627 (–5.2919)***
1/previous period market value of equity	35,668 (4.1004)***
Failed	–12.3484 (–7.1177)***
Average thrift	–1.9579 (–2.5135)***
Marginal effect of failing thrift	2.3473 (2.786)***
Return on assets	11.4836 (4.312)***
Adjusted R^2	0.20
F-statistic	3.905
Number of observations	2,372

*** Indicates significance at the 1% level.

Notes: This table provides the results of a pooled cross series regression relating thrift common stock returns to changes in FHLBank advances, using a two-factor market model. Individual thrift stock market and interest rate variables are omitted. Failed is equal to 1 if a thrift is seized by thrift regulators during the sample period; average thrift is the change in FHLBank advances divided by previous period market value of equity; marginal effect of failing thrift is the change in FHLBank advances divided by previous period market value of equity times the failed indicator variable. The market value of equity is calculated by multiplying the number of shares outstanding at the end of each quarter by the price of the thrift's common stock at the end of the quarter. The numbers in parentheses below the coefficient estimates are t-statistics and have been computed using a procedure suggested by White (1990).

Source: Authors' calculations.

thrifts that were expected to benefit from borrowing at subsidized rates from FHLBanks. We know that during the thrift crisis, the FSLIC assisted insolvent thrifts by using regulatory accounting practices or granting a temporary reprieve from closure. These policies raised the amount by which assets had to fall before regulators would resolve a thrift, increasing access to federal deposit insurance. FHLBank advances were instrumental in allowing financially distressed thrifts to continue to operate. Furthermore, because the FHLBanks' claim to thrift assets was senior to that of the FSLIC, increases in advances increased the FSLIC's risk of loss, raising the value of access to federal deposit insurance (see Brickley and James, 1986). As a result, we would expect an increase in advances to lead to a one-time positive return to shareholders. This effect should be most important for institutions with a relatively high proportion of FHLBank advances on their balance sheets. To investigate this hypothesis, we examined whether the impact of changes in FHLBank advances on thrifts' common stock returns varied across failure groups. A formal discussion of our approach is presented in technical appendix 2.

The results of estimating equation 4 in technical appendix 2 are reported in table 10. The coefficient for failing thrifts measuring the change in FHLBank advances relative to previous quarter market value of equity is the sum of the average thrift coefficient and the marginal effect of failing thrift coefficient and is 0.3905. This coefficient implies that failing thrifts experienced one-time common stock return increases, following an increase in advances from FHLBanks. Are the implied differences in common stock returns large? To answer this question, we need to know what changes in the variable are plausible. One way to establish this is by looking at the impact of a one standard deviation change in a variable. For a normally distributed variable, there is a 68 percent chance that the variable will be within one standard deviation of its mean. A one standard deviation increase in the change in FHLBank advances relative to previous quarter market value of equity was associated with a 253 basis point common stock return increase for failing thrifts. In contrast, the coefficient of –1.9579 suggests that non-failing thrifts experienced a decrease in common stock returns. In other words, the stock market responded positively to increases in advances from FHLBanks only for failing thrifts. This supports the view that such advances provided financially distressed institutions with a subsidy and that value-maximizing troubled thrifts had an incentive to take advantage of this subsidy.

Conclusion

This article examines the FHLBank System and its role in the thrift debacle of the 1980s. The FHLBank System was established to extend funds to thrifts in support of their mortgage lending activity. The perception that thrifts needed a specialized lending institution was based on their unique liquidity problems. While FHLBanks provide thrifts with access to nondeposit sources of funds, they can provide an opportunity for financially distressed institutions to borrow at relatively attractive interest rates. FHLBanks can raise funds at lower cost than non-government entities because of their perceived well-capitalized position, the tax-exempt status of their debt obligations at the state and local levels, and their implicit government guarantee. We have found that during the 1985 to 1991 period, financially distressed thrifts tended to borrow more from FHLBanks than other institutions. In addition,

the regulatory practice of allowing troubled thrifts to artificially inflate their recorded capital tended to be associated with higher levels of borrowing from FHLBanks.

Our results suggest that FHLBank advances were used more by financially distressed thrift institutions than by other firms. Thus, the provision of aid to these institutions may have added to the cost of resolving failed thrifts during the 1980s and early 1990s, contributing to one of the most expensive bailouts in U.S. history. This implies that the FHLBank System advance program can have unintended consequences. The system was created to provide long-term liquidity to lending institutions specializing in residential real estate, so as to improve the flow of mortgage credit. While this concept made sense after the Great Depression, it may not in today's financial market. In the more than 60 years since the FHLBank System was created, the financial markets have become more efficient with the introduction of a secondary market for mortgages and widespread use of mortgage securitization programs. These developments raise the question whether there is a need for a government-sponsored liquidity facility for real-estate-specialized lenders. The question takes on added importance in view of our finding that the smallest thrifts tended to make less use of FHLBank advances than other thrifts. Furthermore, FHLBank advances do not subject borrowing thrifts to the discipline that would be imposed by other creditors and market analysts. By insulating them from market discipline, FHLBank advance programs provide incentives for thrifts to take more risk.

Finally, our results provide empirical evidence that when the advance rate is flat and at the level that a large, well-capitalized institution can obtain in the financial markets, value-maximizing troubled thrifts will tend to borrow more, leading to one-time common stock return increases. Thus, access to FHLBank advances provides benefits to financially distressed institutions and these benefits tend to be reflected in the common stock returns of publicly traded thrifts.

TECHNICAL APPENDIX 1

FHLBank advances and thrift financial characteristics

Following Mays and DeMarco (1989), we relate the ratio of FHLBank advances to total assets to a set of variables representing a thrift's financial characteristics and economic environment. To allow for the role of capital forbearance on a thrift's use of FHLBank advances, we include a variable measuring the extent to which a thrift has been allowed to "invent" assets to artificially inflate its capital. An empirical specification relating the ratio of FHLBank advances to total assets ($A^k_{j,t}$) of thrift j in period t and FHLBank district k to a set of correlates can be written as:

$$1)\quad A^k_{j,t} = \beta_0 + \sum_{k=2}^{12} \beta_{0,k}\, FREG_k + \beta_1\, RISK_{j,t} + \beta_2 BVA_{j,t} + \beta_3 ROA_{j,t} + \beta_4 FB_{j,t} + \in_{j,t},$$

where $RISK_{j,t}$ is a vector that contains the various measures of risk of the asset portfolio of thrift j in period t; $BVA_{j,t}$ is the ratio of book value of capital to total assets; $ROA_{j,t}$ is the return on assets; $FB_{j,t}$ is a variable that captures regulatory forbearance; $FREG_k$ ($k = 2, \ldots, 12$) is an indicator that equals one if the thrift is located in the kth FHLBank district and zero otherwise; and $\in_{j,t}$ is an error term.

The risk index of a thrift's asset portfolio, $RISK_{j,t}$, is captured by a thrift's holdings of commercial real estate loans, residential mortgage loans, and acquisition and development loans. All mortgage variables are divided by total assets. Barth and Bradley (1989) find that, within the mortgage category, insolvent institutions rapidly increased their commercial real estate lending during the 1980s. Barth, Bartholomew, and Labich (1989) indicate that acquisition and development loans, which are loans to finance the purchase of land and the improvements required to convert it to developed building lots, have a positive and statistically significant effect on resolution costs. Table 9 reports the results of our pooled cross-section time-series regressions using yearend data for all FSLIC-insured institutions from 1985 to 1991. The dependent variable is yearend advances to total assets for each institution. The t-statistics reported in table 9 have been computed using a procedure suggested by White (1980).

Thrift stock returns and FHLBank advances

To determine the effect of FHLBank advances on common stock returns, we need to quantify the benefits of access to an FHLBank lending facility. We would expect these benefits to be reflected in the common stock returns of publicly traded thrifts. The behavior of stock returns provides reasonable and readily available information because there is a direct relationship between stock returns and the value of the underlying assets and the value of various types of subsidies. The first step in the development of the empirical model, following Stone (1974), is to relate the common stock return of thrift j in period t, $RET_{j,t}$, to the rate of return on a stock market index in period t, $RMKT_t$, and an interest rate factor in period t, $RTBOND_t$:

$$2) \quad RET_{j,t} = \beta_0 + \beta_1 \, RMKT_t + \beta_2 \, RTBOND_t + \in_{j,t},$$

where $\in_{j,t}$ is a stochastic error term. The asset pricing model in equation 2 has been used by Lloyd and Shick (1977), Lynge and Zumwalt (1980), Chance and Lane (1980), Flannery and James (1984), Kane and Unal (1988), and Kwan (1991) to investigate the interest rate sensitivity of bank and thrift stock returns.

The asset pricing model argues that returns on individual stocks are related, in part, to the return on a market portfolio, a perfectly diversified portfolio of all assets. The variability of the individual stock returns that is related to changes in the return on the market portfolio is market risk. This market risk is characterized by the stock's "beta" value. An "average" stock whose return fluctuates one-for-one with the market return has a beta equal to one. Stocks with greater than average market-related risk have betas higher than one, while low market-risk stocks have betas less than one.

Thrift stock returns are also sensitive to movements in interest rates, because thrifts typically fail to match the interest rate sensitivity of their assets and liabilities. As a result, movements in interest rates affect the market value of each side of the thrift's balance sheet differently and, consequently, both its net worth and stock value.

In addition, stock returns of thrifts might be affected by the extent to which the thrifts make use of loans from FHLBanks. Because the rate charged for advances does not vary according to the financial condition of the borrowing institution, it is possible that some thrifts are paying too high a price and some too low a price to borrow funds. Garcia and Plautz (1988) indicate that advances may not be priced below the rate that a large, well-capitalized thrift could obtain on its own in the deposit market. However, since this is a flat rate, it would seem most likely that the rate charged financially distressed thrifts is below the level the market would charge given the associations' financial condition and collateral. Thus, flat-rate FHLBank advances provide a financially distressed thrift with a subsidy. The common stock returns of such thrifts should reflect this subsidy. Equation 2 can be expanded to account for this subsidy. The expanded model, which is based on a version of the model in Brewer (1995), can be written as:

$$3) \quad RET_{j,t} = \beta_0 + \beta_1 \, RMKT_t + \beta_2 \, RTBOND_t + \beta_3 \frac{1}{MV_{j,t-1}} + \beta_4 \frac{\Delta FHLB_{j,t}}{MV_{j,t-1}} + \in_{j,t},$$

where $\Delta FHLB_{j,t}$ is the change in jth thrift FHLBank advances at time t; and $MV_{j,t-1}$ is the market value of equity of the jth thrift in period t–1.

With flat-rate FHLBank advances, value-maximizing thrifts have an incentive to borrow from their FHLBank to take advantage of the subsidy. How stock returns change with variations in FHLBank advances depends on whether the thrift is in financially distress. As noted earlier, financially distressed institutions are most likely to receive FHLBank advances at rates below those they could obtain in the deposit market. Therefore, we would expect the change in FHLBank advances to have a positive impact on the stock returns of financially distressed thrifts. To investigate this further, we created two groups. The first group includes all thrifts that failed at some point during the sample period. The second group includes only the surviving thrifts. This separation allows us to examine whether changes in FHLBank advances have a different impact on common stock returns of thrifts, depending on their financial condition.

Since thrifts invest primarily in mortgages, we assume that the primary factor affecting the market's valuation of a thrift's assets is changes in the market value of mortgages. The holding period returns associated with long-term U.S. government bonds (*RTBOND*), obtained from Ibbotson Associates (1996) bond index , are used to measure changes in the market value of mortgages. The interest rate factor is based on the returns on U.S. government bonds to ensure that the estimated relationship between thrift stock returns and changes in interest rates is free from contamination resulting from changes in default premia. The long-term

returns index is used because the bulk of thrift assets are long term. The return on a stock market index, *RMKT*, is included in the equation to assess a thrift's systematic market sensitivity.

The other important factors affecting common stock returns are associated with changes in the FHLBank advances relative to market value of equity in the previous period, ($\Delta FHLB_{j,t}/MV_{j,t-1}$), and return on assets in period *t*, ROA_t. We include return on assets to capture the impact of other firm-specific factors on thrift stock returns.

We can now write the following empirical specification:

$$
\begin{aligned}
4)\quad RET_{j,t} = {} & \beta_0 + \sum_{j=1}^{N} \beta_{1,j}\, W_j\, RMKT_t \\
& + \sum_{j=1}^{N} \beta_{2,j} W_j\, RTBOND_t + \beta_3 \frac{1}{MV_{j,t-1}} \\
& + \beta_4 \frac{\Delta FHLB_{j,t}}{MV_{j,t-1}} + \beta_{4,1} \frac{\Delta FHLB_{j,t}}{MV_{j,t-1}} \times \\
& FAILED + \beta_5\, ROA_{j,t} + \\
& \beta_6\, FAILED + \omega_{j,t},
\end{aligned}
$$

where $\beta_{1,j}$ is the stock market beta coefficient of the *j*th thrift ($j = 1, \ldots, N$); $\beta_{2,j}$ measures the effect of interest rates on the stock returns of the *j*th thrift given its relation to the market index; W_j is a cross-sectional dummy variable that equals one for the *j*th thrift and zero otherwise; *FAILED* is a binary variable that equals one for a failed thrift and zero otherwise; and $\omega_{j,t}$ is a stochastic error term. Both the stock market and the interest rate coefficients are held fixed over time, but allowed to vary across thrifts. Estimation of equation 4 allows us to investigate the equity market response to changes in FHLBank advances. The variable *FAILED* serves as a proxy for financially distressed firms. The coefficient on ($\Delta FHLB_{j,t}/MV_{j,t-1}) \times FAILED$, $\beta_{4,1}$, measures how much more the common stock returns of failing thrifts change relative to those of non-failing thrifts as a result of a change in advances from FHLBanks. The sum of β_4 and $\beta_{4,1}$ measures how much more the common stock returns of failing thrifts change with changes in advances from FHLBanks. If access to FHLBank advances is a valuable option for failing thrifts, then an increase in FHLBank advances should lead to an increase in their common stock returns (that is, the sum of β_4 and $\beta_{4,1}$ should be positive).

Notes: The data used in the estimation of equation 4 are for 99 thrift organizations whose stocks were traded on the New York Stock Exchange, American Stock Exchange, or over the counter and which filed FHLBB *Report of Condition* data for each quarter from January 1985 to December 1992. A few of the 99 thrifts were resolved by thrift regulators prior to the end of the sample period. These institutions are included in the sample period for the quarters before resolution and excluded for the period after resolution. Stock market data are from Interactive Data Services, Inc. For multiple thrift holding companies, the assets of individual thrift subsidiaries were summed in constructing the balance-sheet variables used in the regression equations. At the end of 1987, the 99 thrifts had $456 billion in total assets, representing about 47 percent of the industry's total assets. Twenty-five had total assets of more than $5 billion; 48 had total assets of $1 billion to $5 billion; and the 26 remaining thrifts had total assets of less than $1 billion.

Common stock returns over a quarter are calculated by compounding daily common stock returns within a quarter. The market value of common stock is calculated by multiplying the number of shares outstanding at the end of each quarter by the price of the thrift's common stock at the end of the quarter. The holding period return on a long-term U.S. government bond portfolio (from the monthly index by Ibbotson Associates, 1996) is used to measure changes in the market value of mortgages. Monthly returns are compounded to produce quarterly returns. The stock market portfolio is the value-weighted portfolio (NYSE and AMEX) from the Center for Research in Security Prices (CRSP) database.

NOTES

[1]See Garcia and Plautz (1988) for an excellent discussion of the collateralization requirements of the FHLBank System and how troubled S&Ls were able to get around these requirements.

[2]The FSLIC's policies and procedures for guaranteed advances specify that guarantees will be provided for advances only if the insured S&L is a supervisory case that 1) is book-value insolvent, 2) is cash insolvent, 3) is losing money so that it will soon become book-value insolvent, 4) has insufficient collateral to obtain an advance without a guarantee, and 5) has agreed to be merged when the FSLIC can find a suitable merger partner. See Garcia and Plautz (1988) for an excellent discussion of this program.

[3]In October 1984, the FHLBB placed a sunset provision on the use of deferred losses on the sale of mortgages with below-market interest rates. After October 24, 1984, thrifts were prohibited from amortizing losses on sales of new mortgages. However, they were still allowed to defer losses on loans made prior to October 24, 1984. See Hill and Ingram (1989) for a discussion.

[4]Hunter, Verbrugge, and Whidbee (1996) found significant evidence of forbearance in the regulation of de novo thrifts in the 1980s.

[5]An alternative explanation is that the problems in the Dallas FHLBank district were because of the failure of the FHLBank's supervisory staff to adequately control the high-risk behavior of member thrifts. See Cole (1993, 1990) for a discussion of this issue. Another explanation is that congressional pressure persuaded thrift regulators, not only in the Dallas FHLBank district but in other FHLBank districts, to grant forbearance and increased access to the FHLBank advance program to aid poorly capitalized institutions.

[6]Although insurance companies and mutual savings banks were eligible for membership, few, if any, of these institutions applied for membership.

[7]The President of the United States appoints the other four directors. By law, the four appointed directors must have backgrounds in housing finance or a demonstrated commitment to providing specialized housing credit, and one director must have a background with an organization that has a two-year record of representing consumer or community interests on banking services, credit needs, financial consumer protection, or housing.

[8]Retained earnings represent only about 3 percent of total equity capital.

[9]See Mays and DeMarco (1989) for an excellent discussion of these issues.

[10]This special lending arrangement truly provided "last resort" liquidity for insolvent thrifts. The Federal Reserve Banks and FHLBanks would share the loan, except for 10 percent advanced by the FSLIC up to $700 million, in a special borrowing arrangement with the U.S. Treasury. The loans were guaranteed and collateralized by the FSLIC, and subsequent to FIRREA, by the Resolution Trust Corporation. Lincoln Savings and Loan was the first institution to use the program on April 17, 1989.

[11]See Barth, Bartholomew, and Labich (1989).

[12]The permissible spread over the FHLBank System's expected cost of funds is limited by its supervisory agency. See Mays and DeMarco (1989) for a discussion of this point.

[13]Kaufman (1972) used the term technical liquidity problems to refer to a situation in which a thrift institution, as a result of an unanticipated rise in interest rates, generates insufficient current accounting earnings on assets to finance competitive deposit rates.

[14]In their analysis of de novo thrifts, Hunter, Verbrugge, and Whidbee (1996) found that capital was a key factor contributing to the delay in closing failed thrifts.

[15]See Goldberg and Hudgins (1996).

[16]See Barth (1991) for an excellent discussion of this issue.

[17]See Hunter, Verbrugge, and Whidbee (1996) for a discussion of the so-called Gray effect, that is, the tendency of the regulators to keep failed thrifts open in hopes of a miraculous recovery.

[18]We excluded one of the FHLBank district indicator variables to avoid the "dummy variable trap." By including an intercept term and separate indicator variables for each district, we would have a problem of perfect multicollinearity, whereby the sum of the district indicator variables is equal to one and is perfectly correlated with the intercept term. To avoid this dummy variable trap, researchers omit one of the indicator variables (see Greene, 1997, p. 230).

[19]See Romer and Weingast (1992) for a discussion of the role politicians played in prolonging this crisis in the Dallas FHLBank district.

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