

***COMMUNITY BANKS USE OF FHLB ADVANCES
ACROSS THE KANSAS CITY (KC) AND SAN
FRANCISCO (SF) FEDERAL RESERVE DISTRICTS***

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ABSTRACT

This study investigates borrowing from the Federal Home Loan Bank (FHLB) System by community banks over the period 2002 to 2009. In the current economic environment, differences in borrowing and lending patterns between community banks across two distinct regions of the nation provide valuable information to policymakers in terms of how FHLB advances should be administered. This analysis focuses on community banks operating in the San Francisco and the Kansas City Federal Reserve Districts. Of particular concern is the role played by increased FHLB borrowing as a source of real estate lending in the respective regions. *JEL Classifications:* G21, E51

INTRODUCTION

Since the national recession of 2001 and continuing well into the 2008 recession, deposits at many banks across the country have not kept pace with loan demand. Increasingly, bank deposits have been viewed as an unattractive investment alternative. As a result, many banking institutions have been forced to adopt different strategies for bridging this funding deficit. One such strategy that banks have been increasingly utilizing is to rely more heavily on the Federal Home Loan Bank (FHLB) System as an alternative source for funding loan growth. According to the data from FDIC Quarterly Banking Profile, from 2002 to third quarter-2008, FHLB advances for all FDIC-insured institutions increased by \$461 billion—from just over \$450 billion to over \$911 billion.

The paper seeks to answer two basic questions concerning the use of FHLB borrowing by community banks in these two regions over this period. Firstly, do community banks relying on FHLB borrowing have more rapid loan growth than would normally be expected from their deposit growth? Secondly, is reliance on FHLB advances associated with increased risk without the imposition of risk pricing?

Testing differences in selected mean ratios from community banks across both regions, especially those relying heavily on FHLB Advances, should allow us to determine the nature of the risk posed to the Federal Deposit Insurance Corporation (FDIC). In particular, the paper investigates whether increased risk from FHLB borrowing is localized to a particular region, or is it systemic in nature, cutting across a diverse spectrum of geographic regions?

FHLB SYSTEM

The Federal Home Loan Bank system was created in 1932, with a focus on “advancing” funds for mortgage lending by, and with membership restricted to, savings institutions. Prior to the growth of active secondary mortgage markets, a mortgage lender would have to warehouse or hold the loan for its entire life. This “lend and hold” relationship could lead to situations where potentially sound borrowers would be denied credit if the lender was unable to support the loan with deposits. Originally, Congress established the FHLB to make collateralized loans—called advances—to thrift institutions with the purpose of breaking this connection (McDonough (1934)). By creating loans (advances) secured by mortgages already in the institution’s portfolio, proceeds could then be used to create new mortgages. In this way, the FHLB System enabled thrifts to lend to all creditworthy applicants and use existing mortgage loans as collateral to obtain additional funding from a regional Home Loan Bank.

The decline of the savings and loan industry and the shift of mortgage lending to other institutions like commercial banks led to changes in the scope of the FHLB system (Flannery and Frame (2006)). The Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA) of 1989 opened the FHLB to commercial banks and credit unions that held at least 10 percent of their assets in mortgage-related products. The FHLB now offers these thrifts, commercial banks and credit unions a wide range of products and services designed to help fund mortgage loans, manage interest rate risk, and meet the other challenges of an increasingly competitive banking environment. The Gramm-Leach-Bliley (GLB) Act of 1999 widened access further by eliminating the 10 percent membership condition for community banks and enabling these banks to post small business, small farm and small agri-business loans as collateral for long-term advances. GLB also lifted the cap on the amount of other real-estate-related assets, such as commercial real estate loans, that FHLB members can post as collateral (Stojanovic, Vaughan and Yeager (2000)). Banks now constitute the overwhelming majority of FHLB membership.

The impact of the FHLB on the banking sector can be seen in the growth of membership and use of advances. Since the GLB Act of 1999 took effect, nearly all of the nation’s thrifts and commercial banks have obtained membership, whether they are a user of FHLB advances or not. FDIC Call Report data show there were 801 FDIC institutions in 1999 that relied to any extent on FHLB advance-use. These institutions represented only 6.0 percent of the total number (10,223) of FDIC-insured institutions for that year. By 2002, the number FHLB advance-using banks had climbed to 5,072 (representing 54.1 percent of all FDIC-insured institutions). The percentage of all FDIC-insured institutions relying on FHLB advances grew to 60 percent of the total by year-end 2008.

In essence, the FHLB system is a financial intermediary, borrowing funds in world capital markets and lending to domestic member institutions. The system obtains funding by selling debt instruments, which are joint obligations of the regional Home Loan Banks. FHLB debt instruments offer a yield just above the yield on Treasury securities. The FHLB can borrow at a low interest rate because financial markets believe that the U.S. government will not permit default. This belief probably rests on the recent bailouts of two other government-created enterprises—the Farm Credit System in the 1980s and the Financing Corporation in the 1990s (Leggett and Strand (1997))—as well as the 2008 bailouts of Fannie Mae, Freddie Mac, and the Troubled Asset Relief Program (TARP).

Another reason the FHLB can borrow at low rates is the system's collateral policy. Regional Home Loan Banks insist that borrowers pledge assets such as mortgage loans that are worth more than desired advances. That way, if the member bank runs into trouble, the Home Loan Bank can avoid losses by taking possession of the pledged assets.

PROBLEM DEFINED

Increased use of FHLB advances raises a number of potential concerns. For example, in 2002, the Board of Governors of the Federal Reserve System issued *SR 01-08*, "Supervisory Guidance on Complex Wholesale Borrowings," in response to the growing reliance of banks on wholesale borrowings from financial intermediaries, including the Federal Home Loan Banks. FHLB advances may allow banks to take on more risk that is not market priced. As a consequence, the advances may increase the probability of bank failure as well as expected losses to uninsured claimants including the Federal Deposit Insurance Corporation (FDIC).

Easy access to FHLB advances may allow banks to increase risk for several reasons. Without access to FHLB advances, banks would have to limit loan growth to core deposit growth or incur the extra expense of obtaining funds from higher-cost sources. Here core deposits refer to the checking and savings accounts that tend to stay in a bank despite changing economic conditions. Compared to other sources of funds such as CDs or money market accounts, core deposits are generally less vulnerable to changes in short-term interest rates, and their costs generally are more predictable. However, growth in traditional deposit funding sources has stagnated at many banks in recent years and has largely failed to keep up with the growth in bank assets (Harvey and Spong, 2001). Access to FHLB advances enables bankers to evade this constraint on growth. The ability to turn to the FHLB in a pinch can also create a more relaxed attitude about other risks as well (Craig and Thompson (2001)).

The FHLB does not increase the interest rate on advances to risky members because its debt is backed implicitly by the federal government and the advances are backed explicitly by collateral from high quality loans in the bank's portfolio. That means easy access to FHLB funding enables banks to take additional risk without paying a price. Selective credit subsidies can distort banks' incentives (Kane 1999). In addition, an increase in risk today may make it more likely that the FDIC will have to close the bank tomorrow. Under bankruptcy law, collateralized claims are settled first during failure resolution. Should a bank fail, the FHLB would be in line before the FDIC. All other things equal, fewer losses for the FHLB system could imply greater losses for the FDIC.

Stojanovic, Vaughan and Yeager (2007) provide an empirical analysis on whether FHLB membership and advances increase bank's risk-taking. They conclude that using FHLB advances had at most only modestly impact on bank risk, particularly on liquidity and leverage risks, and credit risk and overall failure risk were largely unaffected. However, since Stojanovic, Vaughan and Yeager (2007)'s work is based on data up to the year of 2005, it may not clear the FHLB system from its participation in the subprime lending and securitization practices, The financial crisis in 2008 brought questioning on FHLB's role in the crisis. According to Cassell and Hoffmann (2009), there is little evidence to support the claim that the FHLB system and its practice contribute to the crisis.

Overall, should the growth in bank use of FHLB advances raise concerns with regulators of the banking system, especially in today's economic climate where traditional sources of financing may not have kept pace with loan demand, most notably for lending in real estate markets? If banks use FHLB advances to meet additional loan demand not supported by deposit availability and other traditional sources of funds, does this pose a problem? Lastly, has the current housing bust posed greater problems for West Coast banks than for Midwest banks where real estate lending has been less aggressive?

PURPOSE

This paper seeks to evaluate increasing community bank reliance in the KC and SF Fed districts on FHLB advances, and to determine whether this poses a supervisory concern. The focus is on two specific issues centered around the increased use of FHLB advances by banks: (1) asset growth, and especially that resulting from increased real estate lending, that is potentially more rapid than traditional deposit sources would support, and (2) increased risk without the imposition of risk pricing.

To investigate these concerns, the paper explores three related sets of questions. To what degree have banks relied on FHLB advances as an alternative funding source? Are those banks that rely more heavily on FHLB advances riskier than their non-advance-using peers? Finally, have banks in the West Coast area, a region that has experienced extensive real estate lending, relied more heavily on FHLB advances than those from the Midwest region where real estate lending was more constrained? The answers to these three questions have implications for whether changes in supervisory policy regarding use of FHLB advances are necessary. Most importantly, if FHLB borrowing does indeed pose risks to the FDIC, are those risk localized, or are they more systemic in nature.

SCOPE, DATA AND METHODOLOGY

The scope of this paper is limited to analysis of FDIC-insured community banks - those with assets less than \$1 billion - in the Kansas City (KC) and San Francisco (SF) Federal Reserve districts. This definition is consistent with recent literature (for example, see DeYoung, Hunter and Udell (2004)), but different from that provided by the Gramm-Leach-Bliley Act of 1999, which defined a "community financial institution" as a bank with less than \$500 million in assets.

We compute a variety of financial ratios for community banks in these regions based on year-end reports for 2002 and 2009. The FDIC now reports on the use of FHLB advances in its Quarterly Banking Profile, and banks must disclose use of advances in their regular Reports of Condition (call reports). In addition to exploring trends in the use of FHLB advances by community banks, the paper analyzes key balance sheet ratios to detect if there are important differences between community banks that are heavy users of advances versus those that are non-users.

By year-end 2009 there were 1615 FDIC-insured community banks in the two regions (districts). We define three subgroups of the population of community banks on the basis of their FHLB advance usage. As Table 1 below indicates, the first category consists of the 700 "*non-borrower banks*" (or non-user banks) with balance sheets that show zero FHLB advance balances (just over 40 percent of all FDIC-

insured community banks). Among the remaining (almost 60 percent) of FDIC-insured community banks that have positive FHLB advance balances, we define two additional groups: the 458 advance-using banks holding more than 5.57 percent (approximately the 60th percentile value) of their assets in the form of FHLB advances are defined as “*high-user banks*” and the 457 advance-using banks holding less than 5.57 percent of their assets in FHLB advances are defined as “*minimum-user banks*”. The approximate 60th percentile value (ranked by the percent of assets held as FHLB advances) was used as the cut-off point to ensure equal sample size between the two groups - high-user banks and non-user banks.

For purposes of consistency across time, we used 2009 percentiles for defining user-categories in 2002. As such, the population of community banks in 2002 was 1,863 comprising three groups of community banks: 945 were “*non-borrower (or non-user) banks*” with zero FHLB balances, 447 were “*high-user banks*” holding more than 5.57 percent of their assets in the form of FHLB advances, and 471 were “*minimum-user banks*” with less than 5.57 percent of their assets in the form of FHLB balances.

In the analysis that follows, we compare only two groups of community banks—the “high-users” and “non-users” of FHLB advances as delineated in Table 1. In accordance with the literature, the two comparison groups will also be variously defined as “borrowing” and “non-borrowing” banks, as well as “advance-using” and “non-advance-using” banks.

Table 1
FREQUENCY DISTRIBUTION FOR COMMUNITY BANKS,
BY FED DISTRICT AND YEAR

2009				
	KC	SF	Total	%Total
Number of Non-User banks	473	227	700	60.45%
Number of High-User banks	311	147	458	39.55%
Total	784	374	1158	100.0%
2002				
	KC	SF	Total	%Total
Number of Non-User banks	638	307	945	67.89%
Number of High-User banks	326	121	447	32.11%
Total	964	428	1392	100.0%

The comparisons that follow are based upon balance-sheet and income-statement data from the December Federal Financial Institution Reports of Income and Condition (Call Reports) for all FDIC-insured community banks as of year-end 2002 and year-end 2009. A set of Student's t-tests are performed to determine whether the mean values of our key variables from different samples are statistically different.

Use of FHLB advances makes it possible for banks to grow more rapidly than deposit growth alone allows. If a bank is faced with increasing loan demand from good quality borrowers, the advances are potentially 'life-saving' in that they allow the bank to book good credits and enhance profitability. However, rapid growth may come from expanding loan quantity at the expense of loan quality, and these poorer quality loans may later result in more credit problems for the bank. Because FHLB advances are secured by the best loans in the portfolio, there is no risk pricing on the advanced funds. This arrangement insulates the bank from market pressures that might constrain additional risk through higher rates on other types of borrowed funds.

Table 2 compares key ratios as a percent of total sources and uses of funds for both categories (high-users and non-users) of FHLB borrowers across both SF and KC districts. Percentages are calculated for high-users and non-users for two years: 2002 and 2009. Table 3 compares key ratios as a percent of total sources and uses of funds for banks in each Fed district. And, Table 4 compares key ratios as a percent of total sources and uses of funds for only the high-user categories of FHLB borrowers within each of the respective Fed districts.

The results of the t-tests contained in Table 5 examine a number of safety and profitability ratios for both years for both categories of FHLB borrowers. The results of the t-tests contained in Table 6 examine the same ratios for both years, but across both regions rather than across user categories. Finally, Tables 7 examines the same ratios for 'high-advance using' FHLB borrowers across both Fed districts for both years. Tests of differences of means for selected financial ratios between high-advance-using banks across both FED regions should reveal just how different the FHLB borrowers are in those regions. This allows us to determine if the risk posed to the FDIC from FHLB borrowing is more of a localized nature or whether it is systemic across the various regions.

EMPIRICAL RESULTS

Sources and Uses of Funds by FHLB User category

In 2009, high-users funded a significantly smaller share of their assets from 'core deposits' as compared with non-users. In comparison to non-advance-using banks which held 67.6 percent of their assets in core deposits, high-advance-using banks held 58.2 percent. However, the percentage share for high-users actually rose slightly to 56.8 percent in 2002 while it decreased for non-users, from 68.8 percent in 2002 to 67 percent in 2009. The difference in core deposits percentage between 2002 and 2009 are significant at 1 percent level for both high-users and non-users.

In 2002, FHLB advances accounted for an average of 33.83 million dollars, or 14.64 percent of all funding sources for high-advance-users. This ratio fell slightly in 2009 to 11.51 percent, which on average is 28.43 million dollars of FHLB advances taken by the high-users. The difference between 2002 and 2009 numbers indicate a decline in the dependence on FHLB funds by banks.

It was noted earlier that FHLB advances may allow banks to grow assets while bypassing other markets for borrowed funds including volatile (rate-sensitive) liabilities, such as federal funds purchased, repurchase agreements, Eurodollar time deposits, foreign deposits, or jumbo CDs (deposits greater than \$100,000). Volatile liabilities may be uninsured and greater reliance on them as a source of funds could increase exposure to risk-adjusted pricing. However our results show that high-users

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were also much more reliant on volatile liabilities. At year-end 2009, volatile liabilities accounted for 25.2 percent of assets at high advance-using banks but only 18.7 percent at non-advance-using banks. Since volatile liabilities as a percent of assets are significantly higher and core deposits significantly lower for high-using banks in both years, this is evidence of greater risk at high advance-using banks. It's

TABLE 2
TEST RESULTS OF SELECTED SOURCE OF FUNDS RATIOS FOR COMMUNITY BANKS
BY FHLB USER CATEGORY AND YEAR

	High-User	Non-User	t-Value	Pr t	Year
Sources of Funds					
Core Deposits	58.20%	67.61%	-12.38	0.0000	2009
Volatile Liabilities	25.18	18.71	9.63	0.0000	2009
FHLB Advances	11.51	0.0	49.50	0.0000	2009
Other Sources	5.12	13.65	-17.69	0.0000	2009
Average Liabilities & Equity	\$ 246,980 ¹	\$ 156,518			
Sources of Funds					
Core Deposits	56.80%	68.79%	-14.33	0.0000	2002
Volatile Liabilities	26.37	16.97	12.72	0.0000	2002
FHLB Advances	14.64	0.0	48.59	0.0000	2002
Other Sources	2.19	14.23	-19.86	0.0000	2002
Average Liabilities & Equity	\$ 231,056	\$ 113,448			
Uses of Funds					
Net Loans	69.77%	59.45%	11.31	0.0000	2009
Real Estate Loans	54.90	41.25	12.80	0.0000	2009
Securities	15.37	21.37	-6.77	0.0000	2009
Other Uses	14.86	19.20	-7.03	0.0000	2009
Average Assets	\$ 246,980	\$ 156,518			
Uses of Funds					
Net Loans	66.78%	59.43%	7.79	0.0000	2002
Real Estate Loans	50.69	34.84	15.68	0.0000	2002
Securities	21.59	23.00	-1.6	0.1089	2002
Other Uses	13.30	15.89	--4.68	0.0000	2002
Average Assets	\$ 231,056	\$ 113,448			

Note1: All dollar amounts are in thousands

also worth pointing out that while the difference between 2002's and 2009's usage of volatile liabilities is not statistically significant for high-user banks, non-user banks' dependence on these volatile liabilities in 2009 was a significant increase from their 2002 level (16.97 percent) at 1 percent confidence level.

The comparison of percentage share in "uses of funds" shows high-users of FHLB advances relied more heavily on loans than did their non-advance using peers. The net loans to total assets ratio in Table 2, 3, and 4 is defined as loans and lease financing receivables, net of unearned income, allowance and reserves, as a percent of total assets. In both years, high-users invested a larger portion of their assets in loans compared to non-users. Collateral for securing FHLB advances comes from loans in the borrowing bank's portfolio.

For both groups of banks, most of their loan composition was in real estate loans (mortgages). For both years, a significantly larger share of the assets at high-users was used to finance real estate loans than was the case at non-users.

Finally, Table 2 shows that high-advance users achieved higher loan shares, not by increased reliance on FHLB advances, but rather from disinvestment in securities. Security investments for them accounted for 21.59 percent of total use of fund in 2002, and only 15.37 percent in 2009. The difference is significant at 1 percent level. In the case of non-users of FHLB advances, the percentage increase in real estate loans over the seven-year period, from 34.84 percent in 2002 to 41.25 percent in 2009, came primarily at the expense of investments in other loan categories, not the reduction of security investments. At non-advance using banks, securities fell from 23 percent of assets in 2002 to 21.4 percent of assets in 2009, which is not statistically significant. Cross-sectionally, at year-end 2009 FHLB advance-using banks held a smaller portion of their assets in securities (15.4 percent versus 21.4 percent for non-users) compared to non-user banks. Smaller securities holdings imply lower levels of liquidity. At the same time advance-using banks also held a much larger proportion of their assets in loans (69.8 percent) than banks that did not borrow from the FHLB system (59.5 percent).

Sources and Uses of Funds by Federal Reserve Region

According to Table 3, banks in the SF-Fed funded a significantly smaller share of their asset from 'core deposits' –only 60.6 percent as compared with 65.2 percent for KC-Fed banks – in 2009. However, the percentage share for SF-Fed banks slightly increased from 2002 (57.9 percent) through 2009 while decreasing for banks in the KC-Fed, from 67.7 percent in 2002 to 65.2 percent in 2009. The changes are statistically significant at 1 percent confidence level for banks in both regions. FHLB advances accounted for 6.5 percent of all funding sources for banks in the KC-Fed for 2002, and 5.8 percent in 2009. The change is significant at 1 percent confidence level. This ratio was 8.2 percent for banks in the SF-Fed in 2002, falling in 2009 to 5.7 percent. The change is significant at 5 percent confidence level. Thus banks in the SF-Fed were significantly less reliant on 'core deposits' and more reliant on 'FHLB advances' as a source of funds for both years.

Also, the data in Table 3 provide little evidence that FHLB advances allow banks to grow assets while bypassing other volatile liabilities within both Fed regions. In 2009, the percentage share in volatile liabilities as a source of funds was greater for the SF-Fed region (24.2 percent) than was the case for the KC-Fed region (19.7 percent). On a relative basis, this source of funds increased for the KC-Fed while decreasing for the SF-Fed region from 2002 to 2009.

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and San Francisco (SF) Federal Reserve Districts*

**TABLE 3
TEST RESULTS OF SELECTED SOURCE AND USES OF FUNDS RATIOS
FOR COMMUNITY FOR COMMUNITY BANKS BY FED DISTRICT AND YEAR**

	KC-Fed	SF-Fed	t-Value	Pr t	Year
Sources of Funds					
Core Deposits	65.17%	60.63%	5.97	0.0000	2009
Volatile Liabilities	19.65	24.24	-6.81	0.0000	2009
FHLB Advances	5.83	5.68	-0.64	0.5204	2009
Other Sources	9.35	9.42	-0.16	0.8752	2009
Total Liabilities & Equity	\$ 138,172	\$ 265,283			

Sources of Funds					
Core Deposits	67.67%	57.92%	11.65	0.0000	2002
Volatile Liabilities	17.29	26.04	-11.84	0.0000	2002
FHLB Advances	6.47	8.17	-5.66	0.0000	2002
Other Sources	8.57	-7.85	1.19	0.2343	2002
Average Liabilities & Equity	\$ 99,085	\$ 245,418			

Uses of Funds					
Net Loans	59.27%	69.94%	-11.68	0.0000	2009
Real Estate Loans	41.90	54.25	-11.58	0.0000	2009
Securities	24.93	11.81	14.82	0.0000	2009
Other Uses	15.81	18.25	-3.95	0.0000	2009
Average Assets	\$ 138,172	\$ 265,283			

Uses of Funds					
Net Loans	61.19%	65.01%	-4.06	0.0000	2002
Real Estate Loans	44.07	57.30	-9.1	0.0000	2002
Securities	25.51	19.09	7.3	0.0000	2002
Other Uses	11.30	15.89	--4.68	0.0000	2002
Average Assets	\$ 99,085	\$ 245,418			

The comparison of percentage share in “uses of funds” shows that banks in the SF-Fed region relied more heavily on loans than did their KC-Fed banks peers. In both years, SF-Fed banks

invested a larger portion of their assets in loans compared to KC-Fed banks. For both groups of banks, most of their loan composition was in real estate loans (mortgages). For both years, a significantly larger share of the assets in the SF region was used to finance real estate loans than was the case at KC-Fed banks.

Finally, Table 3 shows that SF-Fed banks achieved higher loan shares, not by increased reliance on FHLB advances, but also from disinvestment in other uses. At year-end 2009 SF-Fed banks held a smaller portion of their assets in securities (11.8 percent versus 24.9 percent for banks in the KC-Fed). Smaller securities holdings imply lower levels of liquidity. During the period examined, securities ratios shrank for banks in the SF-Fed, while their loan ratios rose. The SF-Fed banks decreased their securities holdings from 19.1 percent of assets in 2002 to 11.8 percent of assets in 2009. At banks in the KC-Fed, securities fell only slightly from 25.5 percent of assets in 2002 to 24.94 percent of assets in 2009. In the case of the SF-Fed region, the percentage increase in real estate loans over the seven-year period came primarily at the expense of investments in other loan categories.

Banks in the SF-Fed devote a higher percentage of their assets to loans (73.2 percent) than is the case for banks in the KC-Fed (66.4 percent) in 2009. The same is true with regard to real estate loans. In 2009, the SF-Fed region devoted 54.25 percent of their assets to real to real estate lending while the KC-Fed region devoted only 41.9 percent. Compared to 2002, in 2009, both groups decreased the share of their assets going to real estate loans.

Sources and Uses of Funds by High-User Banks by Federal Reserve Region

In Table 4, we focus on “high-user” banks in both SF and KC districts. According to Table 4, high-user banks in the SF-Fed funded a significantly smaller share of their asset from ‘core deposits’ –only 56.8 percent as compared with 64.5 percent for non-users in 2009. The percentage share for high-user banks in the SF-Fed increased from 2002 through 2009 while decreasing slightly for high-user banks in the KC-Fed, from 61.89 percent in 2002 to 59.59 percent in 2009. FHLB advances accounted for 11.7 percent of all funding sources for high-user banks in the KC-Fed in 2009 which was relatively unchanged from 2002. In 2002, this ratio was 16.4 percent for banks in the SF-Fed falling to 11.4 percent in 2009. Thus banks in the SF-Fed were significantly less reliant on ‘core deposits’ as a source of funds for both years, and more reliant on ‘FHLB advances’ in 2002.

In 2009, the percentage share in volatile liabilities as a source of funds for high-user banks was greater for the SF-Fed region (28 percent) than was the case for the KC-Fed region (22.3 percent). On a relative basis, this source of funds increased for high-user banks in the KC-Fed while decreased for those in the SF-Fed region from 2002 to 2009.

The comparison of percentage share in “uses of funds” shows that high-user banks in the SF-Fed region relied more heavily on ‘loans’ than did their non-advance using peers. In both years, SF-Fed banks invested a larger portion of their assets in loans compared to KC-Fed banks. For both groups of banks, most of their loan composition was in real estate loans (mortgages). For both years, a significantly larger share of the assets in the SF region was used to finance real estate loans than was the case at KC-Fed banks.

**TABLE 4
TEST RESULTS FROM SELECTED SOURCE AND USES OF FUNDS RATIOS
FOR HIGH-FHLB USER COMMUNITY BANKS BY FED DISTRICT AND YEAR**

	KC-Fed	SF-Fed	t-Value	Pr t	User	Year
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Sources of Funds

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Core Deposits	59.59%	56.80%	5.3	0.0000	High-User	2009
Volatile Liabilities	22.33	28.03	-6.0	0.0000	High-User	2009
FHLB Advances	11.66	11.36	0.9	0.3595	High-User	2009
Other Sources	6.43	3.81	3.9	0.0000	High-User	2009
Average Liabilities & Equity	\$ 168,110	\$ 325,851				
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Sources of Funds						
Core Deposits	61.89%	51.71%	8.4	0.0000	High-User	2002
Volatile Liabilities	20.26	32.48	-11.5	0.0000	High-User	2002
FHLB Advances	12.93	16.35	-7.9	0.0000	High-User	2002
Other Sources	4.92	-0.54	6.3	0.0000	High-User	2002
Average Liabilities & Equity	\$134,752	\$ 327,361				
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Uses of Funds						
Net Loans	66.35%	73.19%	5.3	0.0000	High-User	2009
Real Estate Loans	47.67	62.14	9.7	0.0000	High-User	2009
Securities	20.21	10.54	1.8	0.0000	High-User	2009
Other Uses	13.44	16.27	3.3	0.0011	High-User	2009
Average Assets	\$ 168,110	\$ 325,851				
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Uses of Funds						
Net Loans	66.20%	67.36%	-0.9	0.3900	High-User	2002
Real Estate Loans	44.07	57.30	-9.1	0.0000	High-User	2002
Securities	22.56	20.63	1.5	0.1283	High-User	2002
Other Uses	11.25	12.00	-0.9	0.3429	High-User	2002
Average Assets	\$134,752	\$ 327,361				

Finally, Table 4 shows that high-user banks in the SF-Fed achieved higher loan shares, not by increased reliance on FHLB advances, but rather from disinvestment in other uses. In the case of the SF-Fed region, the percentage increase in real estate loans over the seven-year period came primarily at the expense of investments in other loan categories. At year-end 2009, FHLB advance-using banks in the SF-Fed held a smaller portion of their assets in securities (10.5 percent versus 20.2 percent for high-using banks in the KC-Fed). At the same time advance-using banks in the SF-Fed also held a much larger proportion of their assets in loans (73.2 percent) than their counterparts in the KC-Fed (66.35 percent).

During the period examined, securities ratios shrank for both groups of banks, while loan ratios rose for advance-using banks in both regions increased. The

high-user banks in the SF-Fed decreased their securities holdings from 20.66 percent of assets in 2002 to 10.5 percent of assets in 2009. At advance-using banks in the KC-Fed, securities fell modestly from 22.6 percent of assets in 2002 to 20.2 percent of assets in 2009.

Overall, our sources and uses data suggest that banks that borrow more FHLB advances also have more volatile liabilities in their balance sheets, and they make more loans, particularly real estate loans. Comparison between banks in SF region and KC region suggest that SF-area banks rely more on FHLB advances, and more volatile liabilities, indicating higher level of risks undertaken by these banks.

Safety and Profitability Ratios by FHLB User category

As revealed in Table 5, high-user and non-user banks also differ in their equity positions. At both the beginning and end of the period examined, FHLB borrowing banks (High-users) have a lower average equity ratio and a lower core capital ratio than non-borrowing banks. Here core capital is defined as common equity capital plus noncumulative perpetual preferred stock plus minority interest in consolidated subsidiaries, less goodwill and other ineligible intangible assets. Because the equity position absorbs losses, such as asset write-downs due to loan quality problems, it acts as a buffer standing for the deposit insurance fund. Banks with lower capital levels have smaller cushions to absorb any losses and therefore are subject to higher risk of default.

The characteristics analyzed so far are consistent with the view that riskier banks have relied more heavily on FHLB advances as a funding source. However, a comparison of loan charge-offs suggests that the extent of this risk has been small over the period examined. Here net charge-offs is defined as total loans and leases charged off (removed from balance sheet because of uncollectibility), less amounts recovered on loans and leases previously charged off. Net charge-offs were significantly lower in both 2009 and 2002 for advance-using banks. While future loan losses might arise (if in fact there is a decline in asset quality), there is little evidence that high-users are more subject to this kind of loss over the period examined. It's also worth pointing out that both high-users and non-users display significant higher level of charge-offs in 2009 compared to the 2002 level.

As another measure of asset risk, the percentage of noncurrent assets (loans, leases, debt securities and other assets that are 90 days or more past due, or in nonaccrual status) appear to be higher for high-user banks for 2009 (4.25 percent vs. 3.43 percent). This shows a different trend compared to 2002: high-user banks tend to have lower percentage (0.75 percent) of non-current assets in 2002.

Changes in the composition and cost (total interest paid) of bank funds can indirectly affect a bank's credit risk by forcing it to reduce asset quality. For example, banks that substitute purchased funds for demand deposits will often see their cost of funds rise. From Table 5, it can be seen that the cost of funding earning assets was significantly higher for advance-using banks in both years. Higher costs of funds may contradict the idea that high-users are taking advantage of the low-cost feature of FHLB financing; however this may suggest the overall higher risk taken by these banks.

**TABLE 5
TEST RESULTS FROM SELECTED SAFETY AND PROFITABILITY RATIOS
FOR COMMUNITY BANKS BY FHLB USER CATEGORY AND YEAR**

Safety Ratios	Hi-User	Non-User	t-Value	Pr t 	Year
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*Community Banks Use of FHLB Advances Across the Kansas City (KC)
and San Francisco (SF) Federal Reserve Districts*

Total Assets	\$246,980	\$156,474	7.80	0.0000	2009
Equity capital ¹	9.51%	11.96%	-7.36	0.0000	2009
Core capital ratio ¹	9.04	11.32	-7.47	0.0000	2009
% Insured deposits	83.63	80.35	3.82	0.0000	2009
Noncurrent assets ¹	4.25	3.43	3.53	0.0004	2009
Net charge-offs ²	1.59	1.83	-1.91	0.0567	2009

Total Assets	\$ 230,156	\$ 113,448	12.5	0.0000	2002
Equity capital ¹	9.35%	12.38%	-8.06	0.0000	2002
Core capital ratio ¹	8.80	11.57	-3.95	0.0000	2002
% Insured deposits	76.30	74.34	2.16	0.0311	2002
Noncurrent assets ¹	0.75	0.97	-2.74	0.0062	2002
Net charge-offs ²	0.26	0.87	-6.45	0.0000	2002

Profitability Ratios	Hi-User	Non-User	t-Value	Pr t	Year
Yield on Assets	5.71%	6.02%	-2.49	0.0129	2009
Cost of funding assets	2.02	1.43	14.94	0.0000	2009
Net Interest Margin	3.70	4.58	-7.3	0.0000	2009
Return on assets	-0.51	0.17	-4.52	0.0000	2009
Return on Equity	-9.34	1.44	-5.76	0.0000	2009

Yield on Assets	6.75%	7.07%	-2.25	0.0248	2002
Cost of funding assets	2.58	1.94	16.45	0.0000	2002
Net Interest Margin	4.17	5.13	-7.09	0.0000	2002
Return on assets	1.23	1.46	-2.0	0.0458	2002
Return on Equity	14.06	12.96	1.38	0.1664	2002

Note 1: As a percent of total assets

Note 2: As a percent of loans

Evidence from net interest margin in these advance-using banks suggests that these additional risks may not be compensated enough by higher prices charged by these banks. Here net interest margin refers to the difference between interest and dividends earned on interest-bearing assets and interest paid to depositors and other creditors, expressed as a percentage of average earning assets. As seen in Table 5, net interest margin charged by high-user banks are significantly lower than the net interest margin charged by non-users in both 2002 and 2009.

In terms of profitability ratios, the results in Table 5 reveal that advance-using banks have a significantly lower return on assets than do their non-advance-using peers in both years. Their average return on equity ratio was higher in 2002 but significantly lower in 2009 for advance-using banks. It's also worth pointing out that on average, high-user banks' ROA and ROE are both negative in 2009.

High-user community banks may be using FHLB advances and other borrowed funds as part of a leverage strategy. Such strategies are intended to increase return to owners (ROE) by leveraging the bank's capital to purchase earning assets funded by borrowed funds. As long as the net interest margin and return on assets (ROA) are positive, the return on equity (ROE) is magnified. On the other hand, if a bank using greater leverage suffers losses (negative ROA), then the loss suffered by the owners will also be magnified. Leveraging strategies increase assets and liabilities while decreasing the bank's capital ratios and increasing leverage ratios.

For both 2002 and 2009, FHLB borrowers have a lower core capital ratio (8.8 percent and 9.0 percent, respectively) than the non-FHLB borrowers (11.6 percent and 11.3 percent, respectively) do. It thus appears that FHLB advance users are using significantly greater financial leverage than non-advance users, which explains the deterioration of ROE relative to the deterioration of the ROA for the high-user banks in 2009.

Safety and Profitability Ratios by Federal Reserve Region

As revealed in Table 6, banks in the two geographic groups also differ in their equity positions. At both the beginning and end of the period examined, banks in the SF-Fed have a higher average equity ratio and a higher core capital ratio than KC-Fed banks for both 2002 and 2009. SF-Fed banks appear to have higher percentage of non-current assets in 2009, while the difference is not significant in 2002.

A comparison of loan charge-offs suggests that the extent of this risk has been small over the period examined with net charge-offs being significantly higher for banks in the SF-Fed. From Table 6, comparison in cost of funding assets is not conclusive: it was significantly higher for SF-Fed banks in 2009, but the other way around in 2002. SF-Fed banks appear to be offsetting the additional interest expense by having higher yielding investments or charging higher interest rates. Consequently, banks in SF region have higher net interest margins in both 2002 and 2009.

In terms of profitability ratios, the results in Table 6 reveal that banks in the SF-Fed have a lower return on assets (ROA) than do their counterparts in the KC-Fed in 2009 but slightly higher ROA in 2002. Their average return on equity ratio was extremely positive in 2002 (13.98 percent) but then extremely negative in 2009 (-14.43 percent).

For both 2002 and 2009, banks in the SF-Fed have a higher core capital ratio at about 10.7 percent than do banks in the KC-Fed at about 9.7 percent. Thus, it would not appear that banks in the SF-Fed are using significantly greater financial leverage than banks in the KC-Fed.

TABLE 6
TEST RESULTS FROM SELECTED SAFETY AND PROFITABILITY RATIOS FOR
COMMUNITY BANKS BY FED DISTRICT AND YEAR

Safety Ratios	KC	SF	t-Value	Pr t 	Year
Total Assets	\$138,171	\$265,283	-10.96	0.0000	2009
Equity capital ¹	10.33%	11.15%	-2.49	0.0128	2009
Core capital ratio ¹	9.71	10.65	-3.09	0.0021	2009

*Community Banks Use of FHLB Advances Across the Kansas City (KC)
and San Francisco (SF) Federal Reserve Districts*

Insured deposits	84.51	79.47	5.88	0.0000	2009
Noncurrent assets ¹	2.58	5.10	-10.88	0.0000	2009
Net charge-offs ²	0.68	1.17	-3.6	0.0004	2009
Total Assets	\$99,085	\$245,418	-15.6	0.0000	2002
Equity capital ¹	10.32%	11.37%	-2.8	0.0047	2002
Core capital ratio ¹	9.72	10.65	-1.3	0.1856	2002
Insured deposits	80.81	69.83	12.1	0.0000	2002
Noncurrent assets ¹	0.91	0.80	1.4	0.1520	2002
Net charge-offs ²	0.37	0.76	-4.2	0.0000	2002
Profitability Ratios	KC	SF	t-Value	Pr t 	Year
Yield on Assets	5.61%	6.12%	-4.19	0.0000	2009
Cost of funding assets	1.66	1.79	-3.20	0.0014	2009
Net Interest Margin	3.95	4.33	-3.29	0.0010	2009
Return on assets	0.63	-0.98	10.70	0.0000	2009
Return on Equity	6.54	-14.43	11.20	0.0000	2009
Yield on Assets	6.63%	7.19%	-4.0	0.0000	2002
Cost of funding assets	2.38	2.14	6.2	0.0000	2002
Net Interest Margin	4.25	5.05	-6.0	0.0000	2002
Return on assets	1.25	1.45	-1.7	0.0817	2002
Return on Equity	13.04	13.98	-1.2	0.2320	2002

Note 1: As a percent of total assets

Note 2: As a percent of loans

Safety and Profitability Ratios for FHLB Advance-using Banks by Federal Reserve Region

As revealed in Table 7, advance-using banks in the two geographic groups also differ in their equity positions. At the end of the period examined, FHLB high-user banks in the SF-Fed have a slightly lower average equity ratio and core capital ratio than high-user banks in the KC-Fed for 2009.

A comparison of loan charge-offs suggests that, while the extent of this risk seems to be similar for banks in the two districts during 2002, net charge-offs are significantly higher for high-using banks in the SF-Fed in 2009. This increase in net charge-offs is statistically significant at 1 percent confidence level for the high-users in SF-district banks.

TABLE 7
T-TEST RESULTS FROM SELECTED SAFETY AND PROFITABILITY
RATIOS FOR HIGH-USER COMMUNITY BANKS BY FED DISTRICT AND YEAR

Safety Ratios	KC-Fed	SF-Fed	t-Value	Pr t	User	Year
Total Assets	\$ 168,111	\$ 325,851	-8.74	0.0000	hi-user	2009
Equity capital ¹	9.93%	9.10%	1.77	0.0768	hi-user	2009
Core capital ratio ¹	9.25	8.83	01.00	0.3193	hi-user	2009
% Insured deposits	84.88	84.15	2.07	0.0391	hi-user	2009
Noncurrent assets ¹	2.94	5.56	-8.03	0.0000	hi-user	2009
Net charge-offs ²	0.98	2.21	-7.14	0.0000	hi-user	2009

Total Assets	\$ 134,751	\$ 327,360	-12.2	0.0000	hi-user	2002
Equity capital ¹	8.66%	8.93%	0.1	0.9357	hi-user	2002
Core capital ratio ¹	8.66	8.93	-0.3	0.7893	hi-user	2002
% Insured deposits	81.23	71.38	7.5	0.0000	hi-user	2002
Noncurrent assets ¹	0.95	0.55	3.5	0.0004	hi-user	2002
Net charge-offs ²	0.27	0.25	0.2	0.8797	hi-user	2002

Profitability Ratios	KC-Fed	SF-Fed	t-Value	Pr t	User	Year
Yield on Assets	5.78%	5.65%	0.76	0.4477	hi-user	2009
Cost of funding assets	1.99	2.04	-0.95	0.3405	hi-user	2009
Net Interest Margin	3.79	3.61	1.10	0.2698	hi-user	2009
Return on assets	0.34	-1.37	8.07	0.0000	hi-user	2009
Return on Equity	3.08	-21.76	9.46	0.0000	hi-user	2009

Yield on Assets	6.73%	6.77%	-0.2	0.8467	hi-user	2002
Cost of funding assets	2.68	2.48	3.5	0.0004	hi-user	2002
Net Interest Margin	4.05	4.29	-1.2	0.2229	hi-user	2002
Return on assets	1.21	1.26	-0.3	0.7686	hi-user	2002
Return on Equity	13.61	14.51	-0.8	0.4277	hi-user	2002

Note 1: As a percent of total assets

Note 2: As a percent of loans

From Table 7, it can be seen that the cost of funding earning assets was not significantly different for advance-using banks in the two regions for 2009, while KC-district high-user banks seem to have higher cost of funding assets in 2002.

When we compare the net interest margin of high-user banks in KC and SF areas, the differences in net interest margin are insignificant for both 2002 and 2009. Therefore we cannot find evidence to suggest high-user banks with higher risks (in SF region) factor these risks adequately in their pricing.

In terms of profitability ratios, the results in Table 7 reveal that banks in the SF-Fed have a significantly lower return on assets (ROA) and return on equity (ROE)

than do their counterparts in the KC-Fed in 2009. The differences on ROA and ROE between SF- and KC-banks are not significant in 2002. In addition, average ROE ratio for high-user banks in SF-Fed region turned highly negative in 2009.

For 2009, high-using banks in the SF-Fed have a lower core capital ratio (8.83 percent) than do banks in the KC-Fed (9.25 percent) but the difference is not statistically significant. Thus, it would appear that high-using banks in the SF-Fed and in KC-Fed are not using significantly different financial leverage strategies.

Our results suggest that overall, banks that rely more on FHLB advances have lower capital cushion and higher percentage of noncurrent assets, which indicate higher risks born by these banks. These banks, particularly those in SF Fed district also suffer from higher costs and lower profitability. Overall FHLB-dependent banks (especially those in SF-Fed region) ended up with negative earnings and returns (ROA and ROE) in 2009. These results post concerns for the performance and risk-taking behavior of FHLB-dependent banks.

CONCLUSIONS

In this paper we used comparative analysis to study potential differences in the financing and lending patterns of two sets of community banks: high-users and non-users of FHLB advances. In the current economic environment, we found it instructive to highlight differences in borrowing and lending patterns between community banks across two distinct regions of the nation - one from the West Coast and the other from the Midwest. In that regard this analysis focused on community banks operating in two distinct regions of the nation: the Kansas City (KC) and San Francisco (SF) Federal Reserve Districts. The analysis sought to determine whether increased FHLB borrowing over the period 2002 to 2009 by community banks in these two regions is related to more rapid loan growth than deposit growth would have allowed.

Of particular concern is the role played by increased real estate lending in the respective regions. Consequently, we tested for differences in selected mean ratios from community banks across both regions. In the two regions, we focused on those community banks that relied more heavily on FHLB advances. In particular, our paper investigated whether FHLB borrowing is more localized or systemic in nature across a broader spectrum of geographic regions?

During both periods (2002 and 2009) and in both regions, we found that institutions that use more FHLB advances tend to rely more on volatile liabilities and less on core deposits. FHLB advance-using banks also are associated with lower equity capital and lower core capital ratio. Since capital coverage ratios are used to measure a bank's ability to absorb and sustain future losses, lower equity coverage and core capital ratio suggest higher risk faced by the FHLB-dependent banks. These same banks also have higher loan-to-asset ratios, particularly higher real estate loan, suggesting that they are more active in lending and making real estate loans. However more active lending did not bring them more profit, since our results show that their profitability ratios (yield on assets, net interest margin, ROA, and ROE) are significantly lower compared to those of the non-users. Consequently, our findings suggest that advance-using banks in both regions face higher risk than non-using banks in the region.

Comparisons between high-user banks in the two regions are less conclusive. Interestingly, differences in core-capital coverage ratios for FHLB-dependent banks

in the two regions were insignificant in both 2009 and 2002. Dependence on FHLB loans in advance-using banks in the SF region is associated with higher net charge-offs, and lower profitability (ROA and ROE) in 2009. In addition, we could not find significant differences between the net interest margins in these two regions for either year. Overall, our findings reveal higher risks faced by banks that actively take advantage of their access to FHLB loans and this is a pattern that appears systemic across a broad geographic spectrum. Our findings also suggest that the interest charged by these FHLB-dependent banks do not adequately reflect the higher risks taken by these banks. While specific details of this risk exposure still await more exploration, our findings support the proposition that FDIC examiners should continue to ensure compliance with sound liquidity and safety principles.

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